GEORGIA PUBLIC SERVICE COMMISSION

Georgia Power Company's 2016 Integrated Resource Plan and Application for Decertification of Plant Mitchell Units 3, 4A and 4B, Plant Kraft Unit 1 CT, and Intercession City CT

~ Docket No. 40161 and Docket No. 40162 ~

Direct Testimony of

Tim Woolf

On the Topic of

Demand-Side Management

On Behalf of

The Sierra Club

May 3, 2016

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1. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name, title, and employer.

A. My name is Tim Woolf. I am a Vice President at Synapse Energy Economics, located at 485 Massachusetts Avenue, Cambridge, MA 02139.

Q. Please describe Synapse Energy Economics.

A. Synapse Energy Economics (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 economic and technical assessments of demand-side and supply-side energy resources; energy efficiency policies and programs; integrated resource planning; electricity market modeling and assessment; 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 advocates, the U.S. Environmental Protection Agency, U.S. Department of Energy, U.S. Department of Justice, the Federal Trade Commission and the National Association of Regulatory Utility Commissioners. Synapse has over 25 professional staff with extensive experience in the electricity industry.

Q. Please summarize your professional and educational experience.

A. Before joining Synapse Energy Economics, I was a commissioner at the Massachusetts Department of Public Utilities (DPU). In that capacity, I was responsible for overseeing a substantial expansion of clean energy policies. This included significantly increased ratepayer-funded energy efficiency programs, an update of the DPU energy efficiency guidelines, the implementation of decoupled rates for electric and gas companies, the promulgation of net metering regulations, review and approval of smart grid pilot programs, and review and approval of long-term contracts for renewable power. I was also responsible for overseeing a variety of other dockets before the commission, including several electric and gas utility rate cases.

Prior to being a commissioner at the Massachusetts DPU, I was employed as the Vice President at Synapse Energy Economics, a Manager at Tellus Institute, the Research Director at the Association for the Conservation of Energy, a Staff Economist at the Massachusetts Department of Public Utilities, and a Policy Analyst at the Massachusetts Executive Office of Energy Resources.

I hold a Masters in Business Administration from Boston University, a Diploma in Economics from the London School of Economics, a Bachelor of Science in Mechanical Engineering, and a Bachelor of Arts in English from Tufts University. My resume, attached as Schedule TW-1, presents additional details of my professional and educational experience.

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

A. Energy efficiency policies and programs have been at the core of my professional career. While at the Massachusetts DPU, I played a leading role in updating the Department's energy efficiency guidelines, in reviewing and approving utility three-year energy efficiency plans, in reviewing and approving utility energy efficiency annual reports, in convening a working group on rate and bill impacts of utility energy efficiency programs, and in advocating for market rules to enable energy efficiency to participate in the New England wholesale electricity market.

As a consultant, I have reviewed and provided recommendations concerning utility energy efficiency policies and programs throughout the United States and Canada, and I have testified on these issues in British Columbia, Colorado, Delaware, Florida, Kentucky, Maine, Massachusetts, Minnesota, Missouri, Nevada, Nova Scotia, Québec, and Rhode Island. My work has encompassed all aspects of energy efficiency program design and implementation, including cost-benefit analyses, avoided costs, efficiency potential studies, efficiency measure assessment, program delivery options, program budgeting, utility performance incentives, and other relevant regulatory policies.

Additionally, I have been the lead technical consultant for the National Efficiency Screening Project, which is comprised of a team of experts and advocates dedicated to improving the techniques used to screen energy efficiency resources. I have also represented clients in several energy efficiency collaboratives, where policies and programs are discussed and negotiated among a variety of stakeholders, including utilities, commission staff, consumer advocates, and efficiency advocates.

I have worked for a variety of clients on energy efficiency issues, including regulatory commissions, consumer advocates, environmental advocates, and an efficiency program administrator.

Q. On whose behalf are you testifying in this case?

A. I am testifying on behalf of the Sierra Club.

Q. Have you previously testified before the Georgia Public Service Commission?

A. No.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to review the demand-side management (DSM) programs proposed by Georgia Power Company (GPC or the Company) in its application for the Certification, Decertification, and Amended Demand-Side Management Plan in Docket No. 40162, and its 2016 Integrated Resource Plan (IRP) in Docket No. 40161. I represented Sierra Club as a member of the DSM Working Group (DSMWG) from March through December 2015, and thus I am familiar with the Company's DSM planning process and its proposed portfolio of DSM programs.

2. SUMMARY OF CONCLUSIONS AND RECOMMEDATIONS

Q. Please summarize your primary conclusions.

A. First, I would like to make an important point that seems to have been missed by the Company in developing its DSM programs and portfolio. It is now standard regulatory and utility practice to treat DSM as a resource that can be used to avoid higher-cost supply-side resources. This means that DSM offers a variety of benefits to *both* program participants and non-participants. While it is true that DSM program participants experience reduced electricity bills, it is also true that all customers experience reduced long-term costs as a result of deferred generation capacity, reduced transmission costs, reduced distribution costs, increased reliability, and reduced risk.

Throughout the DSM Working Group process and in the IRP filing, the Company has not given DSM an accurate and fair vetting relative to other electricity resource options, in contrast with fundamental IRP and sound regulatory planning practices. GPC did not follow the DSM Planning Process required by the Commission; did not operate in a collaborative, open fashion with the DSM Working Group; did not provide relevant information requested by members of the DSMWG; was not willing to seriously consider DSM budgets that were higher than its Base DSM Case; would not model the Advocates' DSM Case in the way that we asked it to; and did not develop an Aggressive DSM Case that was realistic or meaningful. This cannot be described as treating DSM as a "priority resource," as required by the Commission. The Company apparently is not interested in truly investigating DSM opportunities, regardless of the benefits that they might provide to customers.

As a result, the Company's proposed Base DSM Case represents a very limited portfolio of programs, relative to the cost-effective efficiency potential available in this state. Its program budgets are arbitrarily capped, and it is not implementing several cost-effective DSM programs that would reach more participants and reduce customer costs overall. The DSM Advocates have prepared an alternative DSM case, with slightly higher budgets for the Company's proposed programs, and several new programs that have been successfully delivered by other utilities. Relative to the Base DSM Case, the Advocates' DSM Case would reduce electricity costs by roughly $72 million; would increase the program participation by over 168,000 units; would significantly reduce energy consumption; and would significantly reduce the need for new generation capacity. (I am not at liberty to indicate how much generation capacity would be avoided by the Advocates' DSM Case, because the Company has designated that information as trade secret. That information is presented in Exhibit TW-3.) In sum, the Advocates' DSM Case would cost less, save more energy and capacity, and serve more customers. Yet, the Company has decided to reject this very reasonable and feasible alternative to its Base DSM Case.

The Company's extremely limited approach to DSM planning is based entirely on one argument that is repeated frequently by the Company: that the DSM programs will cause unreasonable rate impacts. However, the Company has not prepared a meaningful, transparent analysis of the likely impact on rates of its DSM programs. In fact, the very limited information that GPC does provide regarding its rate impact analysis indicates that the analysis is fundamentally flawed and overstates rate impacts. It double-counts the lost revenues from DSM programs; it assumes that a rate case will occur every year, which is not likely in practice; it understates avoided costs by not optimizing the system fuel mix as a consequence of DSM impacts; and it does not account for the efficiency savings for those years after the end of the study period. Each of these flaws leads to significantly overstated rate impacts. All of these problems together indicate that the Company's rate impact analysis dramatically overstates rate impacts and cannot be used for making important decisions regarding DSM resources or any other resources. It is remarkable that the Company rests so much of its DSM decision-making on a rate impact analysis that (a) it is very reluctant to reveal to the Commission and to the members of the DSM Working Group; and (b) is so fatally flawed.

Further, the Company has apparently missed another key consideration that has important implications regarding rate impacts from DSM: program participation impacts. Customers who participate in DSM programs will typically experience reduced bills as a result of the efficiency savings, even if their rates increase slightly. Therefore, rate impacts from DSM programs will be significantly mitigated by customer participation in those programs. The Company's DSM programs are expected to serve roughly 22 percent of residential customers and 31 percent of commercial customers from 2017-2019. Considering the customers that have already been served by the Company's DSM programs for many years, and the customers that are likely to be served after 2019, it is likely that a large majority of GPC's customers will participate in its DSM programs. This means that the negative implications of any rate impacts would be very small indeed. As noted above, the Advocates' DSM case would result in even more participants, further mitigating any DSM rate impacts.

In sum, the Company has not given DSM an accurate and fair vetting relative to other electricity resource options. As a consequence, the Company's customers will pay higher costs and bear higher risks than necessary.

Q. Please summarize your recommendations.

A. I offer the following recommendations:

1. The Commission should require the Company to revise its DSM Plan to include the programs, budgets, and savings levels in the Advocates' DSM Case. The revised DSM Plan should include the increased budgets for the Company's proposed DSM programs, as well as the additional programs proposed by the Advocates.

2. The Commission should reject the Company's rate impact analysis, and should not use that analysis to make any resource planning decisions.

3. The Commission should require the Company to conduct a meaningful and transparent rate impact analysis for future planning purposes. The rate impact analysis should include a comprehensive assessment of the long-term rate and bill impacts, and should correct for the flaws identified in my testimony. The rate impact analysis should also include a comprehensive assessment of the customer participation rates for each DSM program.

4. The Commission should require the Company to work collaboratively and openly with interested stakeholders in the DSM Working Group to develop a methodology for rate impact analyses. This work should commence within six months of the Commission's order in this docket.

5. The Commission should require the Company to present the results of future rate impact analyses in all future DSM certificate filings and all IRP filings with the Commission.

6. The Commission should require the Company to work more openly and collaboratively in future DSM Working Group meetings. This should include providing members with critical data associated with DSM planning; willingness to have an open discussion of DSM program budget options; better attempts to reach agreement on key parameters of the Base DSM Case; modeling the Advocates' Case using the Advocates' assumptions; modeling an Aggressive DSM Case that is realistic and meaningful; and providing the rate impact analysis as part of the DSM program modeling information.

3. HIGHLIGHTS OF THE COMPANY'S PROPOSED DSM PROGRAMS

Q. Please summarize the Company's 2017-2019 Base DSM Case.

A. Table 1 presents a summary of the Company's proposed DSM programs, including the budgets, the energy (MWh) savings, the capacity (MW) savings, and the participation (units) for 2017-2019.[1]

[1] Data taken from the Company's workbook titled: 2 TS 2016 IRP DSM Case Sum Data (redacted version).

Table 1. Georgia Power Company Base DSM Case 2017-2019: Vital Statistics

Program	Budget ($1000)	Energy Savings (GWh)	Capacity Savings (MW)	Participation (Units)
Residential	68,450	203	69	1,991,560
Commercial	102,881	856	258	180,749
Cross-Cutting	1,479	N/A	N/A	N/A
Total Portfolio	172,809	1,060	327	2,172,309

Q. Is the Company's proposed Base DSM Case cost-effective?

A. Yes, the portfolio as a whole is extremely cost-effective. Table 2 presents a summary of the cost-effectiveness results for the Company's total DSM portfolio under the Total Resource Cost (TRC) test, the Program Administrator Cost (PAC) test, and the Participant Cost test. [2] The results of the PAC test indicate that the Company's DSM program activities for these three years will reduce electricity system costs by $586 million.

Table 2. Georgia Power Company DSM Program Portfolio 2017-2019: Cost-Effectiveness

Test	Costs ($000)	Benefits ($000)	Net Benefits ($000)	Benefit-Cost Ratio
Total Resource Cost Test	334,121	782,646	474,368	2.5
Program Administrator Cost Test	197,173	783,575	586,401	4.0
Participant Cost Test	138,417	1,136,215	997,797	8.2

Q. Why do you emphasize the results of the PAC test over the other tests?

A. The results of the Program Administrator Cost test are most useful for making regulatory decisions regarding energy efficiency program cost-effectiveness. This test reflects the extent to which energy efficiency programs will reduce utility revenue requirements and

[2] Data taken from the Company's workbook titled: 2 TS 2016 IRP DSM Case Sum Data (redacted version).

therefore reduce average customer costs. This test is also consistent with the criteria used to compare different resource scenarios in the context of IRP.

Q. Why do you not present the results of the RIM test in Table 2 above?

A. The Rate Impact Measure (RIM) test is a measure of customer equity, not of cost-effectiveness. Furthermore, the RIM test is not even a good indicator of customer equity, and can be very misleading. A rate impact analysis is a much better indicator of customer equity than the RIM test.

Q. The Company notes that its proposed Base DSM Case is less cost-effective than the portfolio presented in the 2013 IRP.[3] What does that imply about the proposed Base DSM Case?

A. The fact that the current DSM portfolio is less cost-effective than a previous portfolio does not mean that the current programs are not highly valuable in and of themselves. As indicated above in Table 2, for every dollar that GPC spends on energy efficiency, it reduces customer costs by roughly four dollars on average. That is a highly cost-effective DSM portfolio and a wise use of ratepayer funds.

[3] Georgia Power Company, Application for the Certification, Decertification, and Amended Demand-Side Management Plan, Docket No. 40162, page 5.

Q. The Company has stated that because its proposed Base DSM Case is less cost-effective than in the 2013 IRP that it will "monitor program costs and economics from 2017 through 2019 and will be prepared to modify programs if significant upward pressure on rates continues"[4] Do you agree with this approach?

A. No. While it is always important to monitor DSM program economics over time, there is no evidence to suggest that the proposed 2017-2019 Base Case DSM programs will cause unreasonable upward pressure on rates.

First, the Company's own analysis indicates that its current DSM programs are highly cost-effective, as indicated in Tables 2 and 3 above. Second, the Company has not provided evidence to conclude that its DSM programs are causing unreasonable upward pressure on rates. The rate impact analysis provided by the Company is fundamentally flawed, as I describe in Section 7 of my testimony. If the Company wishes to significantly reduce its DSM program activities as a result of rate impact concerns, then it has an obligation to first provide the Commission and other stakeholders with sufficient supporting evidence. This should include a transparent, meaningful analysis of the long-term rate impacts of the programs. This issue is addressed in more detail in Section 7 of my testimony.

Q. Please describe the types of benefits offered by the Company's DSM programs.

A. DSM offers several significant benefits to the utility system and its customers. In particular:

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4 Georgia Power Company, Application for the Certification, Decertification, and Amended Demand-Side Management Plan, Docket No. 40162, page 5.

- DSM will reduce the costs of generating electricity by deferring or avoiding new generation capacity needs, and by reducing the cost of operating the current fleet of power plants.
- DSM will reduce the costs of transmitting and distributing electricity—including the cost of losses—by providing an electricity resource at the location where it is used, in customers' homes and buildings.
- DSM helps reduce several important risks, including: (a) the financial risks associated with fossil fuels and their inherently unstable price and supply characteristics; (b) the financial risks associated with the construction of generating and transmission plants, especially large, long lead-time plants; and (c) the planning risk inherent in load forecasting. DSM is the equivalent of a low-cost, fixed-price contract with a term equal to the operating life of the efficiency measure.
- DSM can improve the overall reliability of the electricity system. First, efficiency programs can substantially reduce peak demand, which is when reliability is most at risk. Second, by slowing the rate of growth of electricity peak and energy demands, energy efficiency can provide utilities and generation companies more time and flexibility to respond to changing market conditions.

Q. Does DSM provide benefits to all electricity customers?

A. Yes. Many of the benefits cited above, including reduced generation capacity costs, reduced transmission and distribution costs and losses, reduced risk, and improved reliability will be experienced by all electricity customers. It is true that customers who participate in the DSM programs will experience *additional* benefits in the form of immediate reductions in electricity consumption and bills, but participants do not experience all of the benefits exclusively. DSM is an electricity resource that will reduce the costs and risks of the entire electricity system.

4. OVERVIEW OF THE COMPANY'S DSM PLANNING PROCESS

Q. How did the Company develop the programs in its Base DSM Case?

A. The Company states that it followed the nine-step planning process known as the "DSM Program Planning Approach." In addition, the Company met with the DSMWG seven times from 2013 through 2015 in an attempt to reach agreement on DSM program development.[5]

Q. Please summarize the DSM Program Planning Approach.

A. The DSM Program Planning Approach can be summarized as follows:

1. Hire a consultant to assist with updating the Technology Catalog, conducting the technical, economic and achievable potential study, and designing DSM programs.
2. Conduct a technical, economic, and achievable potential study.
3. Update the Technology Catalog.
4. Bundle DSM measures into programs and present the programs to the DSMWG.
5. Share customer data/feedback gathered during the Company's program design development with the DSMWG.

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[5] Georgia Power Company, Application for the Certification, Decertification, and Amended Demand-Side Management Plan, Docket No. 40162, page 4.

6. After identifying programs to be analyzed, conduct an economic screening, and share the results of the analysis with the DSMWG.

7. Attempt to reach consensus between GPC and the DSMWG on DSM program offerings.

8. Analyze at least one aggressive DSM change case that is developed with the assistance of the DSMWG.

9. Calculate the final cost-effectiveness tests for the DSM programs.

Q. Did the Company properly follow the DSM Program Planning Approach?

A. No. While the Company technically performed each of the nine steps above, for several of the steps it merely "went through the motions" and did not comply with the intent of the DSM planning process. The main problems were that the Company did not share relevant information with the DSMWG; imposed artificial constraints on the DSM program budgets; and did not develop a meaningful Aggressive DSM Case.

Q. Please explain how the Company did not share relevant information with the DSMWG.

A. The Company refused to provide the DSMWG with several critical pieces of information, despite requests from the DSMWG members. This included information regarding the avoided costs of DSM, and basic information regarding the costs and benefits of the proposed DSM programs. This information is essential for the members of the DSMWG to understand the implications of the proposed DSM programs, and withholding it is clearly inconsistent with the intent of the DSM Program Planning Approach.[6]

Q. Please explain how the Company imposed artificial constraints on the DSM program budgets.

A. During the course of the DSMWG the Company was unwilling to consider alternative budgets for its DSM programs, arguing that the budgets are outside the scope of the DSMWG.[7] Prohibiting a discussion of DSM budgets in this way is clearly inconsistent with the DSM Program Planning Approach because it does not allow for the flexibility to examine alternative DSM programs and program budgets. This constraint precludes the members of the DSMWG from having any input into one of the most important aspects of DSM program design.

Q. Please explain how the Company did not develop a meaningful Aggressive DSM Case.

A. The eighth step in the DSM Program Planning Approach clearly envisions that the Company will develop and analyze at least one DSM case that is more "aggressive" (i.e., larger budgets and greater savings) than the Company's Base DSM case. The Company developed an Aggressive DSM Case that included higher budgets and higher savings, but then designed the Aggressive DSM Case in such a way as to make it meaningless.

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6 DSM Working Group, Advocates' Report, January 25, 2016, page 3.
7 DSM Working Group, Advocates' Report, January 25, 2016, pages 3-4.

The Company defined the Aggressive DSM Case by simply increasing the customer rebates for efficiency savings to the full 100 percent of incremental cost. The Company describes the Aggressive DSM Case as a "reference point to estimate the maximum achievable potential for increased energy efficiency."[8]

However, this basic premise underlying the Aggressive DSM Case is unreasonable because it is inconsistent with sound program design, it overstates the likely cost of achieving efficiency savings, and it understates the potential savings available from efficiency programs.[9] In addition, designing the Aggressive Case in this way, to indicate the "maximum achievable potential," will by design lead to program budgets and rate impacts that are unacceptable to the Company. Several members of the DSMWG noted these concerns with the Aggressive DSM Case, but the Company proceeded with that case despite these concerns. Ultimately, the Company rejected the Aggressive Case due to its "upward pressure on rates and poor economic efficiency."[10]

It makes no sense to develop and analyze a DSM case that neither the Company nor the members of the DSMWG think is a reasonable, meaningful case to implement. This approach is clearly inconsistent with the letter and the intent of the eighth step in the DSM Program Planning Approach.

8 Georgia Power Company, 2016 Integrated Resource Plan, page 5-68.
9 DSM Working Group, Advocates' Report, January 25, 2016, page 6.
10 Georgia Power Company, 2016 Integrated Resource Plan, pages 5-60 to 5-61.

Q. Could the Company have developed a more reasonable and meaningful Aggressive DSM Case?

A. Yes. The Company could have chosen to consider the Advocates' DSM Case for the Aggressive DSM Case. In fact, this seems to have been anticipated in the DSM Program Planning Approach where is says that the Aggressive Case should be developed "with the assistance of the DSMWG."

The DSM Program Planning Approach also says that the "aggressive change DSM case(s) could also include higher penetrations for the DSM programs proposed in the Company DSM change case." Such higher penetrations could easily be achieved by increasing the budgets of the Company's proposed DSM programs, without changing the customer incentive levels at all. This would result in greater net benefits to customers, and would mitigate equity concerns by expanding the number of customers who participate in the DSM programs.

5. THE ADVOCATES' DSM CASE

Q. Why did the Advocates prepare an alternative DSM portfolio?

A. During the course of the DSM Working Group it became clear to me and other members that the DSM programs proposed by the Company would result in substantial missed opportunities to achieve efficiency savings and reduce electricity costs. We therefore constructed an alternative DSM case that could be used to compare against the Company's proposal.

Q. What about the Aggressive DSM Case? Why not adopt that as the Advocates' preferred DSM portfolio?

A. As described in the previous section, several members of the DSMWG determined that the Aggressive DSM Case proposed by the Company should not be used for DSM planning purposes, because it is based on several unrealistic and flawed assumptions. Therefore, these DSMWG members concluded that it was necessary to construct a different DSM case that would provide a meaningful alternative to the Company's DSM case.

Q. Please describe the approached used by the Advocates to develop an alternative DSM case.

A. We used several important concepts in designing the Advocates' DSM Case. First, there clearly is value in expanding the budgets, implementation, and savings of the Company's Base DSM Case. Second, the Company should serve several important customer sectors that are not covered by the Company's Base DSM Case. Third, the programs that the Advocates proposed are all based on DSM programs that have been successfully implemented by other electric utilities, and the designs and assumptions for our proposed programs are based on the experience of those other successful programs. Finally, recognizing the Company's reluctance to adopt aggressive DSM programs, we proposed budget and savings targets that are more modest than we think are actually achievable and cost-effective. In sum, we proposed a highly credible, extremely reasonable, easily achievable portfolio of programs designed to reach a "middle ground" between our preferred portfolio and the Company's Base DSM Case.

Q. Please describe the key elements of the Advocates' DSM Case.

A. The Advocates' DSM Case is built off of the Company's Base DSM Case, and includes two types of modifications: (a) a modest increase in existing program budgets and savings; and (b) several new DSM programs, including Multi-Family Affordable Housing; Upstream Manufactured Homes; Residential On-Bill Financing; a Commercial Behavioral Change program; and an Industrial Efficiency program.

This portfolio of DSM programs is not only larger than the Company's in terms of budgets and savings, it is also explicitly designed to reach a broader range and a greater number of customers. This approach helps to spread the direct benefits of DSM across customers more equitably than the Company's proposed portfolio.

Q. Did the Company model the Advocates' DSM Case in the way that the Advocates asked them to model it?

A. No. The Company was unwilling to model the Advocates' DSM Case using the assumptions that we provided. The Company made numerous modifications regarding the costs and the savings of the new DSM programs in the Advocates' Case. Most, if not all, of the Company's modifications resulted in increased program budgets or reduced program savings, or both. Consequently, the cost of saved energy (in cents per kWh) for the Advocates' case that the Company modeled was 23 percent higher than the cost of saved of saved energy for the case proposed by the Advocates.[11] These modifications

[11] DSM Working Group, Advocates' Report, January 25, 2016, page 5.

made by the Company significantly reduced the net benefits and the cost-effectiveness of the Advocates' Case.

Q. What were the results of the Company's analysis of the Advocates' DSM Case?

A. Despite the fact that the Company made several pessimistic adjustments to the Advocates' Case, its analysis demonstrates that the Advocates' Case is cost-effective and offers significant benefits over the Company's Base DSM Case. Table 4 presents several key results for the Advocates' DSM Case compared with those of the Company's DSM Case.[12] (The Company has claimed that the energy savings and the capacity savings of the Advocates' DSM Case are trade secret, and therefore I have not revealed those results in Table 4. Exhibit-TW-3 presents the same table, including the information that has been redacted from Table 4.)

Table 4. Base DSM Case Compared with Advocates' DSM Case (2017-2019)

Program	PAC Net Benefits ($mil)	Energy Savings (GWh)	Capacity Savings (MW)	Participation (Units)
Base DSM Case	585	1,060	327	2,172,309
Advocates' DSM Case	657	redacted	redacted	2,340,783
Differences	72	redacted	redacted	168,474

Q. What conclusions can be drawn from the results in Table 4 and Exhibit TW-3?

A. First, the Advocates' DSM Case is highly cost-effective, and will reduce total electricity costs by $657 million (according to the Program Administrator Cost test), which exceeds the net benefits expected from the Base DSM Case by $72 million. Second, the Advocates' DSM case will serve more customers than the Base DSM Case, with 168,474

[12] Data taken from workbook provided by GPC titled: 2 TS 2016 IRP DSM Case Sum Data (un-redacted version).

more efficiency units being implemented. Third, the Advocates' DSM Case will save more energy and capacity than the Base DSM Case, as indicated in Exhibit TW-3. In sum, the Advocates' Case will cost less, save more, and serve more customers than the Base DSM Case.

Q. Did the Company model the Advocates' DSM Case in its IRP?

A. No. GPC did not model the Advocates' DSM Case in its IRP process. The Company states that it "does not recommend approval of the Advocates' Case due to rate impacts of the plan and the program assumptions upon which it was based."[13]

Q. Do you agree that the Advocates' DSM Case would result in unreasonable rate increases?

A. No. First, the Company's rate impact analysis is so fundamentally flawed—and so dramatically overstates rate impacts—that it cannot be used to draw such a conclusion. Secondly, the difference in budgets and savings between the Company's DSM Case and the Advocates' DSM Case are so small that the differences in rate impacts are likely to be very small, and not sufficient justification for rejecting this case. Third, the Advocates' Case would result in increased program participation by additional electricity customers, thereby helping to mitigate concerns about whatever small rate impacts there might be.

Q. Do you agree that the Advocates' DSM Case is unrealistic or unreasonable?

A. No. As noted above, one key aspect of the Advocates' DSM Case was simply increased budgets and savings for the Company's proposed programs, a very realistic and

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[13] Georgia Power Company's 2016 Integrated Resource Plan, page 5-61.

reasonable assumption. The new DSM programs proposed for the Advocates' Case were all based on program designs and assumptions from successful programs offered by other electric utilities. These are all reasonable assumptions, and certainly do not justify completely dismissing the Advocates' DSM Case without even modeling it in the IRP.

Q. Please summarize your view of the Company's treatment of the DSM Program Planning Approach and the DSM Working Group.

A. It appears as though the Company had no interest in thoroughly evaluating DSM options using input from the DSMWG members. This conclusion is evident given that the Company withheld critical information, used predetermined budget constraints, would only model an Aggressive DSM Case that was considered unrealistic and unreasonable by both the Company and the members of the DSMWG, and refused to model the Advocates' Case using the assumptions proposed by the Advocates.

6. THE ROLE OF DSM IN INTEGRATED RESOURCE PLANNING

Q. Please summarize how the Company modeled DSM in the 2016 IRP.

A. The Company included the energy and capacity savings from its Base DSM Case as a decrement to the load forecasts used in the IRP. Under this approach, new supply-side resources are added onto the GPC system in a way that meets the load requirements that remain after the DSM savings have been taken into account.

The Company included the Base Case DSM in almost all of the sensitivity analyses in the IRP, with two exceptions. First, it ran one scenario with no DSM resources at all, presumably as a baseline to compare with the Base DSM Case. Second, the Company ran one scenario using the Aggressive DSM Case.

Q. Is this a reasonable way to model DSM options in an IRP?

A. No. A comprehensive IRP analysis should investigate several different DSM scenarios, in order to identify the cost-effectiveness of different amounts of DSM. This approach provides the most accurate indication of the economics of DSM, because it allows for a direct and dynamic comparison of DSM to supply-side options. For example, if additional amounts of DSM are sufficient to defer a capacity need, or to allow for an early retirement of an existing power plant, then that benefit would be reflected in the IRP analysis.[14] This type of benefit is not reflected in the approach that the Company used to screen the DSM options for the Base DSM Case, where the avoided costs are fixed regardless of the level of DSM being evaluated.

However, the Company did not undertake even this most basic element of integrated resource planning. By putting the Base DSM Case into virtually every resource portfolio, the Company essentially “hardwired” this amount of DSM into the IRP, and failed to model any meaningful alternative DSM options.

Q. The Company modeled the Aggressive DSM Case in the IRP. Does this not count as an alternative DSM scenario?

A. No. The Aggressive DSM Case cannot be considered a reasonable alternative to the Company’s Base DSM case. As described in Section 4 above, neither the Company nor the members of the DSMWG considered the Aggressive DSM Case to be realistic portfolio of programs that might be implemented by the Company. This single sensitivity

[14] My colleague from Synapse, Dr. Jeremy Fisher, addresses this point in more detail in his testimony for Sierra Club in this docket.

cannot be described as representing a reasonable range of DSM options. The Company's modeling of the Aggressive DSM Case in the IRP appears to be a pointless exercise that was only undertaken to create the impression that the Company was following the steps in the DSM Program Planning Approach.

Q. What does the Company's treatment of DSM in the IRP indicate about the Company's interest in DSM?

A. The Company's modeling of DSM in the IRP creates the same impression as its activities in the DSMWG process; that the Company is not interested in truly investigating DSM options, regardless of the benefits that they might provide to customers. It appears as though the Company is only willing to analyze, and therefore implement, a predetermined amount of DSM, and it prefers not to reveal the true economic value of additional DSM through its modeling exercises.

The Company uses concerns about rate impacts to justify this extremely limited approach to DSM planning, but has not provided the evidence to support this justification. I address this critical issue in the following section.

7. THE RATE IMPACTS OF DSM PROGRAMS

Q. Please explain why the rate impacts of DSM are of such critical importance in this docket.

A. The Company is using rate impacts as the primary criterion for making DSM program decisions. It uses rate impacts to justify its decisions to reject the Advocates' DSM Case and the Aggressive DSM Case.[15] It also uses rate impacts to cast a negative light on the Company's Proposed DSM Case, and to imply that the programs may need to be scaled back over the next several years.[16] In my view, these perceived concerns about rate impacts are significantly overstated and are the single biggest barrier to achieving more cost-effective DSM savings in Georgia.

Q. Has the Commission addressed this issue of rate impacts in recent IRP decisions?

A. Yes. Commission policy requires GPC to "offer a DSM plan that minimizes upward pressure on rates and maximizes economic efficiency."[17] Furthermore, in the 2013 IRP order, the Commission required GPC to conduct a rate impact analysis, noting that because "the Commission's policy is that energy efficiency is a priority resource, the Commission needs to know and understand the long term percentage rate impacts of future certified programs."[18]

Q. Has the Company provided a rate impact analysis as part of its IRP?

A. Technically, yes. In several places in the DSM filing and the IRP the Company notes the negative effects of rate impacts. In some places, it estimates the number of dollars of "upward pressure on rates" created by DSM.[19] However, in its filing the Company provided only a redacted version of the table presenting the results of the rate impact

15 Georgia Power Company, 2016 Integrated Resource Plan, page 5-61.
16 Direct testimony of Larry Legg, on behalf of Georgia Power Company, Docket No. 40162, April 5, 2016, page 9.
17 Direct testimony of Larry Legg, on behalf of Georgia Power Company, Docket No. 40162, April 5, 2016, page 9.
18 Georgia Public Service Commission, Georgia Power Company's 2013 Integrated Resource Plan, Docket No. 36499, page 29.
19 Georgia Power Company, 2016 Integrated Resource Plan, page 5-68.

analysis, without providing the full workbook used to create the table. The Company also provided an un-redacted version of that one table presenting the results. While that un-redacted table provides the results of the rate impact analysis, it provides very little information regarding the assumptions and the methodology used in estimating rate impacts.

Q. Has the Company subsequently provided more details regarding its rate impact analysis?

A. Yes. As a result of a specific request from Sierra Club, the Company provided the full workbook used in calculating the rate impacts. To my knowledge, the Company has not provided any written description of the methodology or assumptions used in the rate impact analysis. Nonetheless, I have been able to work out some of the key elements of the Company's methodology by reviewing the workbook and the formulas in it.

Q. Please summarize the methodology used by the Company in its rate impact analysis.

A. The Company estimated the average company-wide rates (in c/kWh) for 2017-2028, for four different DSM Cases: a No DSM Case, the Company's Base Case, the Advocates' Case, and the Aggressive Case. The rate impacts are determined by comparing the rates of the different DSM cases with the rates of the No DSM Case.

In each case, the Company estimates the utility-wide revenue requirements and the utility-wide sales, and divides the revenue requirements by the sales to determine a utility-wide average electricity rate. In each DSM case, the revenue requirements are adjusted by adding in DSM program costs, the additional sum, and the lost revenues (net of avoided costs) from the DSM programs. Similarly, in each DSM case, the sales are adjusted by subtracting the amount of DSM energy savings from that case.

Q. Please summarize the results of the Company's rate impact analysis.

A. Exhibit TW-4 presents the results of the Company's rate impact analysis, as provided by GPC. (This exhibit contains information that has been designated by the Company as trade secret.)

Q. What is your reaction to the Company's rate impact results?

A. The results presented by the Company are extraordinarily high relative to rate impacts that I have estimated in other jurisdictions, and are much higher than one would expect from DSM programs of the magnitude of GPC's programs.

Q. Please explain why the Company's rate impact estimates are so high.

A. The Company's analysis contains several methodological flaws, each of which tends to overstate the rate impacts, in some cases by a significant amount. Together these flaws result in rate impacts that are likely to be many times higher than the actual rate impacts. The key problems that I have been able to identify with my limited review of the analysis include the following:

- The analysis double-counts the lost revenues from DSM programs.
- The analysis assumes that a rate case occurs every year, which does not happen in practice.
- The analysis understates avoided costs by not optimizing the system fuel mix as a consequence of DSM impacts.

- The analysis does not account for the efficiency savings, and the associated downward pressure on rates, for those years after the end of the study period.

Q. Before going into detail on these points, please explain how DSM programs can cause rates to increase.

A. In general, there are three impacts from DSM programs that will affect rates. First, utility revenue requirements will increase as a result of the DSM program costs incurred by the utility. Second, utility revenue requirements will decrease as a result of the avoided costs of the DSM savings. It is important to note that for all programs that pass the Program Administrator Cost test, over time the reductions in revenue requirements will exceed the increases in revenue requirements, and the long-term net impact of these two effects would be to reduce rates. As indicated in Table 2 above, the Company's DSM programs have a benefit-cost ratio of 4:1 under the PAC test, which means that the downward pressure on rates from the avoided costs will significantly exceed the upward pressure on rates from DSM program costs.

It is the third impact of DSM programs—the reduction in sales—that can result in the rate increases. As sales are reduced from DSM programs, it becomes necessary to increase prices in order to recover the historical costs that are embedded in rates, i.e., to recover the "lost revenues" from reduced sales. If the upward pressure from lost revenues is greater than the downward pressure from reduced revenue requirements, then the net effect will result in higher prices.

This increase in prices only occurs at the time that the Company has a rate case. In the absence of a rate case, rates are not changed as a result of DSM savings.

Q. Please explain how the Company has double-counted rate impacts in its analysis.

A. The rate impact results presented in Exhibit TW-4 indicate how the lost revenues are double-counted. The revenue requirements, sales, and prices are presented for each of the four DSM cases: No DSM, Base Case, Advocates' Case, and Aggressive Case. In each case with DSM, the revenues are adjusted by the DSM cost impacts, the sales are adjusted by the DSM energy savings, and the price is equal to the adjusted revenue requirements divided by the adjusted sales.

This methodology appears to be reasonable, but the data immediately indicates that something is wrong. Note that for all the cases with increasing levels of DSM, there are also increasing levels of revenue requirements. This result does not make sense because the revenue requirements should decline with increasing levels of DSM. Given that the Company's DSM programs have a benefit-cost ratio for the Utility Cost test of 4:1 on average, this result is implausible.

It turns out that the revenue requirements increase with increasing levels of DSM because the Company has included the recovery of lost revenues in the adjustment to revenue requirements. In particular, the Company's analysis adjusts the revenue requirements for each DSM case by (a) adding in in the DSM program costs, (b) adding in the costs of the additional sum, (c) subtracting out the avoided costs, and (d) adding in the lost revenues.[20]

[20] The workbook provided by the Company indicates that the adjustment was made using "net" lost revenues, which is lost revenues minus avoided costs.

The problem with this approach is that lost revenues are not a new, incremental cost that will increase revenue requirements. Instead, they arise from the fact that there are lower sales through which to recover revenue requirements. But the Company uses the lower sales to derive the rates in the cases with DSM. This methodology will clearly result in a double-counting of lost revenues, because the lost revenues are added into the revenue requirements and then are captured again by dividing the revenue requirements by a lower sales volume. Given that lost revenues are a significant driver of rate increases, double-counting them in this way will significantly increase rate impact estimates.

Q. Please explain the implications of the Company's assumptions that there is a rate case every year.

A. In its rate impact analysis, the Company estimates rate impacts for each year from 2017 through 2028, as indicted in Exhibit TW-4. However, the Company's base rates are not adjusted for DSM impacts, or any other impacts, unless there is a rate case. For each year when there is not a rate case, the base rates are not changed, and the lost revenues are not recovered from customers. Instead, the lost revenues must be absorbed by the Company. If there are other mitigating effects on sales, such as new customers or customer sales growth, then these effects will offset the lost revenues from DSM savings. If not, then the utility will have fewer revenues than it would otherwise.

This one simplifying assumption that base rates will be adjusted every year dramatically overstates the rate impacts from DSM. If the Company were to have a rate case every two years on average, then its rate impact estimates are too high by a factor of two. Similarly, if the Company has a rate case every three years on average, then its rate impact estimates are too high by a factor of three.

It is my understanding that there is currently a proposed settlement before the Commission in the GPC acquisition of AGL, which requires that there be no rate case for the next three years. During this period there will be no rate impacts as a result of lost revenues from DSM.

Q. Please explain how the Company overstates rate impacts by not accounting for the efficiency savings after the study period.

A. DSM program costs are typically incurred in a single year, while the benefits, in terms of avoided costs, are experienced for the life of the DSM measure. Therefore, the downward pressure on rates from avoided costs can persist well after the year of DSM investments.

The Company's rate impact analysis does not account for this important effect. It includes DSM Program costs and savings for each year from 2017-2028. This will clearly overstate the rate impacts of DSM by not accounting for the impacts of future avoided costs after that period. A more accurate way to indicate the rate impacts of the DSM programs would be to include the DSM program costs for 2017-2019 only, but to include the avoided costs and lost revenue impacts through 2028. This would reveal much lower rate impacts than those presented by the Company.

Q. Please explain how the Company overstates avoided costs by not optimizing the fuel mix in the scenarios with DSM.

A. The Company applies a simplistic methodology for treating avoided costs and lost revenues. It apparently estimates the "net" lost revenues, which is the total lost revenues minus the avoided costs. This is based on the assumption that the variable portion of the electricity rate (i.e., for recovery of fuel costs) is equal to the variable portion of avoided costs (i.e., the avoided energy costs), and thus the two will cancel. This assumption does not recognize that DSM savings will result in reduced consumption of fuels, which eliminates the highest cost fuels from being consumed, which will essentially result in greater avoided costs.

Because the Company uses a fixed estimate of avoided costs, as opposed to a more dynamic estimate based on the actual operation of its power plants, this potential increase in avoided costs is not accounted for by the Company's simplistic methodology. Once again, this approach used by the Company overstates the rate impacts of DSM.

Q. Are these the only problems with the Company's rate impact analysis?

A. I have not been able to review all the details of the rate impact analysis in the short time that I have had the materials. There may be other problems that I have not been able to identify, such as other ways that the Company has understated avoided costs. Either way, it is clear that the Company's analysis dramatically overstates the rate impacts of DSM.

Q. What does your review indicate about the Company's rate impact analysis?

A. The Company's analysis suffers from several fundamental flaws, each of which leads to overstated rate impacts, and therefore should not be used for any sort of DSM resource decision-making.

8. DSM PROGRAM PARTICIPATION

Q. Please explain why it is important to analyze and understand program participation rates when evaluating DSM programs and their rate impacts.

A. Program participation is a crucial consideration when investigating the rate impacts of DSM programs. Customers who participate in DSM programs will typically experience reduced bills as a result of the efficiency savings, even if their rates increase slightly. Therefore, rate impacts from DSM programs will be significantly mitigated by broader customer participation in those programs.

Q. Has the Company provided any information regarding program participation?

A. Yes. Table 1 provides some information regarding the program participation expected by the Company for 2017-2019. Table 5 provides this information again, along with estimates of program participation rates, which equal the participation (in terms of customers) divided by the total number of customers for that sector.[21]

[21] Data taken from the Company's workbook titled: 2 TS 2016 IRP DSM Case Sum Data (redacted version).

Table 5. Program Participation and Participation Rates; 2017-2019

Sector	Program	Participation (units)	Participation (customers)	Participation Rate
Residential	Behavioral	150,000	150,000	7%
	HVAC Service	8,873	8,873	0%
	New Home	21,513	21,513	1%
	HEIP	65,915	65,915	3%
	Refrigerator Recycle	29,019	29,019	1%
	Lighting	1,716,240	171,624	8%
	Total Residential	**1,991,560**	**446,944**	**22%**
Commercial	HVAC	6,333	6,333	2%
	Small Direct Install	43,891	43,891	14%
	Prescriptive	128,178	42,726	14%
	Custom	2,348	2,348	1%
	Total Commercial	**180,749**	**95,297**	**31%**
Total	**Total Utility**	**2,172,309**	**542,241**	**23%**

Note that for some programs, any one customer may adopt more than one efficiency measure (or unit). For two programs I assume that customers adopt more than one unit: for the Residential Lighting program I assume that each customer purchases 10 light bulbs; and for the Commercial Prescriptive Program I assume that each customer adopts three measures.

The program participation rates presented in Table 4 should be seen as rough approximations, because of these assumptions, and because there may be other examples in which one customer adopts more than one unit. Nonetheless, these results provide a general indication of the portion of GPC's customers that are expected to participate in the Company's DSM programs over the next three years.

Q. What do the program participation results indicate about the extent of customer participation in the DSM programs?

A. The Company's information indicates that a significant portion of customers will participate in DSM programs over the period of 2017-2019. It indicates that roughly 22 percent of residential customers and 31 percent of commercial customers are likely to experience reduced bills as a result of the Company's DSM programs, despite any rate increases. Considering the fact that the Company has already served a considerable number of customers in the past, and the fact that it will likely serve additional customers after 2019, it is very likely that a large majority of customers will participate in DSM programs at one time or another.

Q. What do these program participation results indicate about the Company's concerns about rate impacts?

A. The program participation results put concerns about rate impacts in an entirely different light. If a large portion, and perhaps a large majority, of customers participate in the Company's DSM programs, then most customers will experience bill reductions despite any rate increases.

Q. What do the program participation results indicate about the Advocate's DSM Case?

A. The Advocate's DSM Case was explicitly designed to reach additional customer types and additional numbers of customers. This DSM case might result in slightly higher rates than the Company's DSM Base Case, but the increased participation will mitigate the effect of increased prices.

Q. What do you recommend to the Commission, in light of these points about DSM program participation?

A. This information on program participation is another reason why the Commission should reject the Company's rationale for limiting DSM program budgets and savings on the grounds of rate impacts.

9. RECOMMENDATIONS

Q. What do you recommend with regard to the Company's request for certification of its proposed DSM programs?

A. The Commission should reject the Company's request, and require it to adopt the programs in the Advocates' DSM Case instead. This should include the increased budgets for the Company's proposed DSM programs, as well as all of the additional programs proposed by the Advocates.

Q. How do you recommend the Commission treat the rate impact analysis provided by the Company in the 2016 IRP?

A. I recommend that the Commission reject the Company's rate impact analysis in its entirety. The Company's rate impact analysis should not be used for the purpose of making decisions regarding the magnitude of DSM programs.

Q. What do you recommend regarding future rate impact analyses?

A. I recommend that the Commission require the Company to conduct a meaningful rate impact analysis for future planning purposes. The rate impact analysis should include a comprehensive assessment of the long-term rate and bill impacts, by the most important customer classes. The rate impact analysis should also include a comprehensive assessment of the customer participation rate for each DSM program.

Q. What do you recommend regarding the role of the DSMWG in preparing future rate impact analyses?

A. I recommend that the Commission require the Company to work collaboratively and openly with interested stakeholders in the DSM Working Group to develop a methodology for rate impact analyses. This work should commence within six months of the Commission's order in this docket.

Q. What do you recommend regarding the role of rate impacts in future DSM certificate filings and future IRP filings?

A. I recommend that the Commission require the Company to present the results of future rate impact analyses in all future DSM certificate filings and all IRP filings with the Commission. The Commission should also require the Company to present the results of future rate impact analyses in future DSMWG meetings, along with the results of the other economic analyses.

Q. What do you recommend with regard to the Company's role in future DSM Working Groups?

A. I recommend that Commission require the Company to work more openly and collaboratively in future DSM Working Group meetings. This should include providing members with critical data associated with DSM planning; willingness to have an open discussion of DSM program budget options; better attempts to reach agreement on key parameters of the Base DSM Case; modeling the Advocates' Case using the Advocates' assumptions; modeling an Aggressive DSM Case that is realistic and meaningful; and providing the rate impact analysis as part of the DSM program modeling information.

Q. Does this conclude your direct testimony?

A. Yes, it does.