BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	:		
	:		
v.	:	Docket Nos.	R-2009-2139884
	:		
Philadelphia Gas Works	:		
Philadelphia Gas Works' Revised Petition	:		
For Approval of Energy Conservation and	:		P-2009-2097639
Demand Side Management	:		

DIRECT TESTIMONY OF

DR. DAVID NICHOLS

ON BEHALF OF THE OFFICE OF CONSUMER ADVOCATE

March 26, 2010

1. INTRODUCTION AND SUMMARY

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND POSITION.

A. My name is David A. Nichols. My business address is Synapse Energy Economics, Inc. (Synapse), 22 Pearl Street, Cambridge, Massachusetts 02139. I am a senior consultant at Synapse.

Q. PLEASE DESCRIBE YOUR BACKGROUND AND EXPERIENCE.

A. For three decades, I have professionally assessed the costs and benefits of energy efficiency and conservation to utility ratepayers; designed energy efficiency and conservation programs; reviewed and evaluated energy efficiency and conservation programs of electric utilities, gas utilities, and state agencies; and analyzed utility cost recovery claims associated with such programs. I have also worked in other energy areas such as rate design, resource planning, and renewable resources. I have presented analyses on these matters in testimony before regulatory commissions in two dozen U.S. states and before the U.S. Federal Energy Regulatory Commission, as well as in Canadian provinces. I testified on energy efficiency and conservation before this Commission in Docket No. R-80011069 in 1980, on behalf of the Office of Consumer Advocate. I also assisted the Office of Consumer Advocate in some other energy efficiency and conservation matters, including consideration of the earlier version of its Demand Side Management (DSM) Plan that PGW proposed last year in Docket No. P-2009-2097639. Further information on my background and experience is provided in Exhibit DN-1.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. Philadelphia Gas Works (the Company) has developed a proposal to offer an array of energy efficiency and conservation programs to its firm customers. The Company characterizes these programs as a DSM Plan. The DSM Plan is summarized in Mr. Hershey's pre-filed testimony and described in that of Mr. Plunkett and Mr. Chernick. The Plan itself is Exhibit JJP-6 to the testimony of Mr. Plunkett. My purpose is to assess the DSM Plan with regard to its scope and design, including its program designs and its prospective benefits and costs. I also assess the Company's proposed method of cost recovery. Based on my assessment, I offer recommendations to the Commission.

Q. HOW DID YOU CONDUCT YOUR ASSESSMENT?

A. My assessment is based primarily on a critical review of the Company's evidence. With the assistance of Synapse researcher Kenji Takahashi, I reviewed the DSM Plan and Mr. Plunkett's DSM Plan Workbook (electronic workpapers and calculations that support the Plan). I reviewed the Company's responses to relevant discovery requests propounded by the Office of Consumer Advocate and other parties. I considered the Company's proposal and evidence in the light of my experience with other DSM plans and programs. Although Pennsylvania Act 129 applies to electric utilities and not gas utilities, its approach to DSM embodies useful principles, so I also reviewed Act 129 and certain Commission orders pursuant to Act 129.

Q. WHAT ARE YOUR FINDINGS AND RECOMMENDATIONS?

A. In summary, my findings and recommendations are as follows:

- The PGW DSM Plan is comprised of seven individual programs which together would offer opportunities to participate and glean energy savings and energy bill savings to customers in all rate classes. The suite of programs constitutes a comprehensive plan that widely targets energy efficiency opportunities. The Plan is prospectively cost-effective on a Total Resource Cost basis.
- The Company proposes to rely on implementation contractors to provide the major aspects of program administration, delivery, accounting, and evaluation. I consider this approach more desirable than attempting to provide the bulk of DSM services with in-house PGW staff.
- While PGW's proposal to recover its direct program costs through a new rate adjustment clause is reasonable, the clause should not include a component to recover estimated net lost revenues. Base rate cases should be relied on to establish the relationship between the Company's revenues, sales data, and rates.
- Instead of approving a five-year plan as the Company requests, the Commission should review Company DSM proposals on an essentially year-by-year basis. Since, in the Company's Plan, 2010 is largely limited to program development with actual program delivery starting in 2011, in this case the Commission should decide on programs and spending levels for 2010 and 2011.
- At this time, the Commission should limit the total DSM spending budget for PGW to an amount no more than one percent of its total revenues. For 2010, PGW's plans fall well below that level. For 2011, however, their potential DSM spending should be limited to some $9.3 million, using Mr. Bogdonavage's forecast of total 2011-11 operating revenues. This level of investment would support a very substantial and comprehensive DSM effort. Consideration of any higher level of investment should await accumulated evidence of demonstrated performance over time.
- In order to increase initial cost-effectiveness, provide early opportunities for numerous customers to participate, and facilitate delivering programs within a one

percent of revenues budget constraint, I suggest that the Premium Appliances and Heating Equipment rebate program be rolled out earlier in time than in the Company's filed Plan, and that the Comprehensive Residential Heating Retrofit Program (CRHRP) to install efficiency measures in existing non-low-income houses be rolled out later than planned. Also, the Commercial and Industrial Retrofit program should be rolled out earlier than scheduled in the Plan, if possible.

- PGW's Plan should include more explicit steps to coordinate delivery of its DSM programs with those of the PECO Energy Company (PECo). Moreover, while I support the Company's plan to deliver compact fluorescent lamps (CFLs) within the framework of two of its proposed programs, I do not believe this electricity saving measure should be included until arrangements have been completed for the costs of this measure to be reimbursed by the electric utility.
- Before rolling out the CRHRP, PGW should reassess whether having the initial energy audit free to customers, as proposed, or having a modest fee to promote participant buy-in, is the better route to encouraging participants to install more energy efficiency measures.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. Subsequent sections explicate each point made in my prior answer.

2. THE PORTFOLIO OF PROPOSED DSM PROGRAMS

Q. PLEASE CHARACTERIZE PGW'S DSM PLAN.

A. PGW plans to offer a portfolio of DSM programs that would tap energy efficiency savings opportunities in the facilities of customers in all major rate classes. According to the testimony of Mr. Plunkett, the individual programs would be as follows:

- Enhanced Low-Income Retrofit, a program to improve the efficiency of existing houses' building shells, space and water heating equipment, and lighting, and an expansion of the Company's existing Conservation Works Program (CWP).
- Comprehensive Residential Heating Retrofit, similar to the preceding program but for other than low-income customers.
- Premium Appliances and Heating Equipment, promoting high efficiency appliances and systems to residential and nonresidential customers.
- Commercial and Industrial Equipment Efficiency Upgrades, promoting additional high-efficiency equipment and systems among non-residential customers.
- Commercial and Industrial Retrofit, offering supplemental measures to the preceding program.
- Municipal Facilities Comprehensive Efficiency Retrofit, a program offering technical advice on improvement of City of Philadelphia buildings and facilities.
- High-Efficiency Construction, promoting efficient buildings and systems in residential and non-residential new construction.

Q. DO YOU CONSIDER THE PORTFOLIO OF PROPOSED PROGRAM TO BE COMPREHENSIVE IN SCOPE?

A. Yes, I do. It targets the full range of energy efficiency measures that are available to improve the productivity with which natural gas is consumed in buildings and facilities. Additionally, it attempts to exploit efficiency opportunities in every major type of gas-

using facility. In so doing, it provides a variety of measures that are available to all customer classes. I note that attempting to promote efficiency improvements and savings among all customer classes is a requirement the Commission has adopted for electric utilities pursuant to Act 129. This is a logical approach that I have long urged for gas utility DSM programs as well. In particular, the inclusion of non-residential markets in DSM programs has been found to increase the rate of adoption of efficiency measures in those markets, where customers often confront informational and first-cost barriers to investing in energy efficiency.

Q. WHAT IS THE COMPANY'S PROPOSED BUDGET FOR ITS PLAN?

A. The Company proposes a total five-year budget of over $54 million. The total budget is made up of some $53 million in program-specific budgets plus some $1 million in portfolio-wide costs. Excluding the CFL measure, that budget would be below $51 million. The program-specific budgets are shown in the table below. The column showing budgets without CFLs is based on a Company-provided version of the DSM Plan Workbook without the CFL measure.

Program	*PGW Budget*	*Budget without CFLs*
Enhanced Low-Income Retrofit	$27,033,760	$25,562,854
Comprehensive Residential Heating Retrofit	$13,141,619	$10,953,623
Premium Appliances and Heating Equipment	$5,792,713	$5,792,713
C/I Equipment Efficiency Upgrade	$1,429,628	$1,429,628
C/I Retrofit	$1,146,006	$1,146,006
Municipal Facilities Retrofit	$2,051,417	$2,051,417
High-Efficiency Construction	$2,344,503	$2,344,503

Q. DOES THE COMPANY'S PLAN APPEAR TO BE COST-EFFECTIVE?

A. The Company has performed calculations to assess the cost-effectiveness of the Plan as a whole as well as its component programs, using the Total Resource Cost (TRC) perspective. The TRC perspective assesses costs and benefits from the point of view of the ratepayers as a whole. This is the basic cost-effectiveness perspective embraced by Act 129, and my view has long been that it is the appropriate basic cost-effectiveness perspective for gas utility DSM as well. Mr. Plunkett's assessment of measures and programs in the proposed Plan projects a benefit to cost ratio of 1.96 to 1 for the portfolio as a whole (including the costs and benefits of the CFL measure). Excluding the costs and benefits of CFLs, the total benefit to cost ratio for the portfolio becomes 1.90 to 1. Of course the benefits and costs of the components that make up the Plan vary. Every program is projected to have a benefit to cost ratio above 1 to 1, with or without CFLs.

Q. DID YOU REVIEW THE PROJECTED COSTS OF THE PGW PLAN?

A. Yes, I did. The analysis of the incremental costs that PGW and its customers would incur to implement the measures in the Plan, and for PGW to administer the programs, appeared to me to be reasonably thorough and well grounded. I should point out, though, that for four programs the Company assumes the same incremental costs for DSM measures. These are Commercial and Industrial Equipment Efficiency Upgrades, Commercial and Industrial Retrofit, Municipal Facilities, and High-efficiency Construction. The assumed incremental costs are based on broad averages of costs incurred in other gas utility DSM programs. Ideally there would be more precision in incremental cost estimates for these programs. However, for purposes of indicating

broadly what programs in these four areas might cost, the estimates employed are sufficient to motivate further development of the programs. Moreover, for programs that would be rolled out after 2011, the Company would have time to refine the relevant cost estimates in a plan for 2012, which I would recommend be filed with the Commission in 2011.

Q. WHAT PORTION OF PGW'S TOTAL COSTS WOULD BE INCENTIVES FOR PROGRAM PARTICIPANTS TO UNDERTAKE EFFICIENCY MEASURES, VERSUS OTHER UTILITY COSTS TO OPERATE THE PROGRAMS?

A. According to the cost estimates in Table 3 of the DSM Plan, the utility's costs to operate the programs would not exceed one-quarter of total costs, the remainder being customer or other participant incentives. Non-incentive costs would encompass administration and management, marketing, contractor costs, inspections and verification, and evaluation. It is useful that incentives constitute at least three quarters of costs, at least in the initial years of an expanded DSM effort, as direct participant incentives will help motivate the extensive energy efficiency actions that the Plan calls for. It will be important that the actual non-incentive costs for DSM incurred by PGW over time should remain within the range shown in the Plan.

Q. DID YOU REVIEW THE BENEFITS THAT PGW PROJECTS FOR ITS PLAN?

A. Yes, I did. The benefits of the programs are based on projected energy savings. Savings would grow each year, reaching an annual level equal to 0.82 percent of sales in 2014. Consistent with the TRC perspective, what the economic cost would have been to supply

and deliver that gas was then estimated. My comments on PGW's procedure are as follows:

- The projection of physical gas savings by Mr. Plunkett seems to be a detailed and documented initial estimate of how much the measures in the DSM Plan would reduce gas use. He relied on reported results from a variety of gas DSM programs. The results of these other programs were often informed by impact evaluations conducted to verify initial estimates of savings. For the Enhanced Low-Income Retrofit and the Comprehensive Residential Heating Retrofit programs, Mr. Plunkett assumed that the 15 percent average savings realized by a CWP Comprehensive Treatment Pilot program could be improved upon by PGW, so that 20 percent average savings would be realized for those programs. Mr. Plunkett makes no attempt to subtract the amount of energy efficiency improvement that would occur in the absence of this Plan from his projection of savings. However, the DSM Plan does include steps to evaluate the actual savings realized from DSM programs from time to time, one aspect of which would be to identify the realized net gas savings due to DSM.
- The value of the savings from DSM is calculated using avoided costs prepared by Mr. Chernick. Avoided costs consist of the economic costs to supply and deliver gas to customers over the projected lifetimes of the measures that would be implemented through the DSM Plan. To the extent gas is saved through the programs these costs are "avoided". Mr. Chernick relied on forward prices for estimating avoided natural gas and electricity costs in the short to medium term. He melded forward market prices with US Energy Information Administration long-run price forecasts. Avoided gas costs for different gas uses (baseload, space heating, and water heating) were estimated by taking into account the differences in gas prices for baseload and peaking gas supply and the differences in load shape for baseload, space heating, and water heating. While Mr. Chernick used a simplified approach to estimate avoided electricity and capacity, electricity savings are not central to the PGW DSM plan.

- Indirect benefits that may arise from DSM program, such as net increases in local employment, and reductions in air emissions whose costs are not fully reflected in the costs to supply and deliver gas, are not included in the calculation of avoided cost. Though Mr. Chernick notes that there are such benefits, they go beyond the TRC framework as employed in Pennsylvania. However, they are real benefits. Thus, it is useful to have the Company's estimates of their magnitude.

Q. PLEASE SUMMARIZE YOUR REVIEW OF COSTS AND BENEFITS.

A. In sum, the Company has prepared a reasonable and documented estimate of the total resource costs and benefits of the proposed Plan.

Q. HOW DOES THE COMPANY PROPOSE TO DELIVER ITS DSM PROGRAMS IN THE MARKET?

A. The Company proposes to rely on implementation contractors to provide the major aspects of program administration, delivery, accounting, and evaluation. This approach would extend that used by the Company at the current time for its CWP. There are numerous vendors of energy efficiency services in the market today, both regionally and nationally. Of course the demand for energy efficiency services has been increasing in recent years, so it may take some time for the Company to procure all the services it needs. Nevertheless, I consider this approach more desirable than attempting to provide expanded DSM services with in-house staff. Competitive procurement, which the Company proposes to employ, is the key to obtaining effective services at efficient cost. Of course, the responsibility to effectively manage contractors must remain with key Company staff.

Q. DOES PGW ESTIMATE THE EFFECTS ITS DSM PLAN WOULD HAVE ON THE GAS BILLS CUSTOMERS WOULD PAY?

A. Yes. PGW's estimates of bill and rate impacts by customer rate class are presented in Tables 11 and 12 of the DSM Plan. These calculations assume that the Plan is approved as proposed, and is accompanied by a DSM cost recovery rate rider that includes not only Company spending on DSM but also net lost revenues from decreased sales due to DSM, as discussed below. According to PGW's calculations, average bills would increase during the first four years of its five-year plan. Except for the municipal class whose increases would be somewhat larger, the increases would range from 0.1 to 0.9 percent depending on the year and customer class. Then, in the fifth year, average bills would be lower for all classes. Thereafter, PGW expects that average bills would continue to be lower for all classes over the lifetime of the efficiency measures installed as a result of the DSM, which averages 15 years or more. This pattern is typical of what one would expect from a DSM program – during the period of initial investment, customer savings from usage reductions may not be enough to offset the costs of the program, but as the investment is completed, the savings continue for the life of the measures, so many years of average bill savings follow the initial program investment period. The overall reduction to energy bills is supported by the TRC cost-benefit analysis.

PGW's average bill calculations do not include customers in the Customer Responsibility Program (CRP). CRP customers would continue to pay the same amount even as the low-income DSM program reduces their usage, and thus the amount other customers need to provide to compensate the Company for the CRP discount is reduced.

Q. YOU JUST DISCUSSED BILL IMPACTS. DOES PGW ESTIMATE THE EFFECTS ITS DSM PLAN WOULD HAVE ON THE RATES CHARGED TO CUSTOMERS?

A. Yes. In the Tables I cited previously, PGW also estimates rate impacts by customer class (excluding CRP customers). In the first four years of its five-year plan, the increases would range from 0.6 to 2.4 percent depending on the year and customer class, except that the average increase for the municipal class would be higher. After the fourth year, rate impacts for all classes would decline (and for one class be negative). PGW does not state whether, after the five-year Plan is completed, it expects that rates would be higher or lower as a result of DSM. PGW declined to conduct a cost-effectiveness analysis from the viewpoint of the Rate Impact Measure, which estimates the long-run effects of DSM on rates. In fact there could be a continuing, even if modest, rate impact from DSM after the utility's investment in the program is over. The reason is that sales of gas would be lower after the Plan, because the efficiency measures would remain in place. Thus, PGW might need to recover its fixed costs over a somewhat smaller sales base, leading to somewhat higher rates per unit of gas sold. The fact that there could be a continuing rate impact from DSM is one of the reasons why it is useful to field a DSM portfolio that offers customers in all rate classes meaningful opportunities to participate in DSM programs and reap their direct benefits over time.

Q. HOW DOES PGW PROPOSE TO RECOVER ITS COSTS FOR THE DSM PLAN IT PROPOSES?

A. PGW requests that the Commission establish a new automatic rate adjustment clause to recover the Company's DSM costs. The Company will incur direct expenses to implement the plan: salary and overhead for staff time dedicated to DSM; financial incentives paid to program participants; and a variety of contractor costs associated with delivering, managing, and evaluating the new DSM programs. These are its program costs. In addition to the Company's costs to operate the DSM programs, the clause would recover estimated non-gas revenues lost as a consequence of the energy efficiency measures installed through the Plan. Recovery of actual prudently incurred costs for an approved DSM program, subject to regulatory review of those costs, is a reasonable approach. Recovery of net lost revenues, on the other hand, raises concerns, as I will discuss below.

Q. PLEASE SUMMARIZE YOUR OVERALL CHARACTERIZATION OF THE DSM PLAN.

A. The DSM Plan is a comprehensive suite of programs and measures to tap gas efficiency measures among all customer classes. According to PGW's prospective cost-benefit analysis, the Plan will reduce the total costs of providing gas energy services in Philadelphia. Of course, cost-effectiveness is not the sole determinant of the reasonableness of a DSM Plan. It is also important that a Plan serve all customer classes, promote the most efficient technologies that are available and cost-effective, strive to achieve the maximum feasible energy savings per utility dollar invested, and be delivered

at reasonable cost to the ratepayers. On these measures, I believe PGW's proposals and designs provide the framework or skeleton of a reasonable overall Plan. However, although the portfolio of proposed programs constitutes a useful approach to expanding PGW's energy efficiency services, I believe several modifications to the Plan as offered need to be made. I turn to these next.

3. MODIFICATIONS TO PGW'S PROPOSALS

Q. IN WHAT AREAS TO YOU SUGGEST MODIFICATIONS TO PGW'S PLAN?

A. I suggest modifications in the following areas:

- Lost revenue recovery
- Plan approval and annual review mechanism
- Spending budgets
- Program implementation schedule
- Program design modifications

LOST REVENUE RECOVERY

Q. PLEASE EXPLAIN THE ISSUE REGARDING NET LOST DSM REVENUES.

A. If it is successful, DSM will, all other things being equal, reduce sales of natural gas. If throughput is reduced, the Company will avoid some immediate costs for gas supply, but it will not avoid certain other costs for the operation of the gas utility. When revenue is lost from foregone sales, variable costs are avoided but fixed costs are not. All else equal, reduced sales may erode a utility's earnings. Lost revenue adjustment mechanisms are one way of addressing this phenomenon. I have sometimes proposed such mechanisms in contexts where I felt them necessary inducements to investor owned utilities which would otherwise be reluctant to embark on cost-effective DSM.

Q. COULD YOU EXPLAIN PGW'S LOST REVENUE PROPOSAL?

A. First, I need to step back and note that PGW requests establishment of the Efficiency Cost Recovery Mechanism (ECRM), an adjustment clause that would operate similarly to its existing Universal Service and Energy Conservation Surcharge. The ECRM would allow PGW to recover expenditures on its DSM programs, which I do not object to for PGW. As proposed by PGW, it would also recover lost revenues. Lost revenues would be calculated based on the efficiency measures installed, their estimated effects on sales by rate category, and the distribution costs per Ccf in each rate. My concerns are with the latter aspect of the clause, lost revenues. The lost revenue portion of the clause would be applied to all programs except the Enhanced Low-Income Retrofit program for customers in the Customer Responsibility Program (CRP). This program will reduce payments for the CRP from other customers to the universal service charge, but the Company does not request a clause mechanism to be made whole for any resulting revenue losses.

Q. WHAT ARE YOUR CONCERNS WITH PGW'S PROPOSED LOST REVENUE CLAUSE?

A. My concerns about the proposal include the following:

- Base rate cases are the venue for comprehensively establishing the proper relationship between rates that afford the utility the opportunity to recover its costs and the level of sales. It is my understanding that PGW's financial condition has required, and for some time is likely to continue to require, rate cases of some frequency. Whether or not that were the case, any utility has the opportunity to file a rate application, for example, if its management feels that on the basis of its entire nexus of cost and revenue factors a rate adjustment is

required. The rate case permits comprehensive review of these factors by the regulator.

- Lost revenue mechanisms are necessarily based on estimates of sales changes due to DSM. PGW proposes ongoing evaluation and measurement to verify the gas savings due to its DSM, which is to the good. However, there remains an irreducible element of uncertainty, since one can never know with certainty what energy efficiency measures that reduce sales would have been put into place without a DSM program. If a DSM program is sufficiently cost-effective, some uncertainty about its actual effects can be tolerated. Changes in rates charged customers, on the other hand, should be based on precise data. Lost revenues, by their nature, are always estimates.
- Pennsylvania Act 129 precludes DSM lost revenue clauses for electric utilities. Absent a convincing contrary reason, there is a value to treating electric and gas DSM using a common regulatory approach to the issue of lost revenues.
- Philadelphia Gas Works has demonstrated initiative in developing a comprehensive DSM Plan, from which it envisions multiple benefits to itself, its ratepayers, and its community. If the Commission approves a program cost recovery clause, that clause will cover the great bulk of DSM costs that PGW has identified. I hope the Company will enthusiastically pursue the Plan if the Commission approves it, even if it does not include lost revenue recovery as such.

Q. WHAT IS YOUR RECOMMENDATION REGARDING LOST REVENUES?

A. While PGW's proposal to recover its direct program costs through a new rate adjustment clause is reasonable for PGW, the clause should not include a component to recover estimated net lost revenues. I would note that OCA witness LeLash provides some additional discussion regarding the issue of lost revenue recovery.

PLAN APPROVAL AND ANNUAL REVIEW MECHANISM FOR THE DSM PLAN

Q. FOR WHAT PERIOD OF TIME DOES THE COMPANY SEEK COMMISSION APPROVAL?

A. Since Mr. Plunkett recommends that the Commission approve implementation of the overall PGW DSM program, my understanding is that the Company seeks approval for the full five year plan. PGW expects that as this period draws to a close it would file another five year plan.

Q. SHOULD THE COMMISSION APPROVE A FIVE YEAR DSM PLAN?

A. No. In general, I believe regulators should approve DSM plans for shorter periods of time than five years. That is particularly important in a case such as this, where a considerable expansion of both the scope and scale of DSM is proposed. At least for this initial five year period, my recommendation would be for annual Commission review of PGW DSM plans and budgets proposed for each coming year. In PGW's Plan, and assuming no earlier implementation of programs than is described there, 2010 is largely a year of initial developmental activity, with actual program implementation beginning in 2011.

Therefore, I recommend that in this case the Commission act on the Company's proposals for the years 2010 and 2011 only. The Commission could approve the Company implementing planned programs, spending, and cost recovery for that period of time, all as described in the Plan, but subject to the modifications recommended in this

testimony. The Commission could acknowledge the five-year plan as a useful framework to inform annual submissions, but still decide on actual implementation year to year.

During the third quarter of 2011, the Commission could then review DSM activity to that point, and consider plans for 2012. In order to inform Commission consideration of plans for 2012, the Company should submit an interim activity report covering as much of 2010/2011 as is feasible along with its plans for 2012. PGW proposes, and the Commission should require it, to report on the results of each program year, documenting program activity, including costs, participation, impacts, and any measurement, verification, and evaluation activities undertaken. Figure 2 of the Company's DSM Plan includes a list of elements it would include in such reports.

BUDGETS

Q. WHAT LEVEL OF SPENDING BUDGET DOES PGW PROPOSE FOR ITS DSM PLAN?

A. PGW proposes to spend over $54 million over five years, deliberately attaining an investment level that is "more than twice the average spending" thus far attained by other gas DSM programs in North America (DSM Plan, page 8). During the four years of full program implementation after the initial start-up year, this spending would on average equate to about one and one-half percent of PGW's total operating revenues (Response to OCA Data Request Set IV, question 2).

Q. HAVE YOU ANY CONCERNS ABOUT THE PROPOSED SPENDING LEVEL?

A. Yes, I do. It is my view that during the initial five year Plan period, it would be more reasonable for PGW's DSM investment level to be more in the range of other gas utilities' practices. It took some of the utilities with which PGW compares itself a period of time to reach their current DSM programming and investment levels, yet PGW plans to exceed their efforts soon. PGW projects that its program costs per lifetime therm of gas saved, at $0.36, would be somewhat above, but not far from, the actual and planned costs of $0.31/therm of a group of other gas DSM programs. It is important that PGW's actual costs stay close to other utilities' costs of saved energy. To help ensure this result as it gains experience with comprehensive DSM, the Company should ramp up gas DSM somewhat more slowly, and not attempt to achieve an investment level that is more than twice that of other utilities in North America.

Q. WHAT LEVEL OF SPENDING DO YOU RECOMMEND AT THIS TIME?

A. I would suggest that annual DSM program budgets should not exceed one percent of corresponding annual revenues until the Company's programs show demonstrated results. 2010 is a transition year, during which the Company is operating the CWP and would, according to the DSM Plan, invest another $350,000 in developing new programs to be rolled out after 2010. Therefore, 2011 would be the first full year of the new DSM programs. Under my proposal, PGW's potential DSM spending for 2011 would be limited to some $9.3 million, if one used Mr. Bogdonavage's forecast of total 2010-11 operating revenues as the basis for setting the budget. If one removes CFL costs from PGW's budget for 2011, that alone would almost reduce Plan costs to this level. It is not

clear to me that the utility will necessarily have an easy time productively investing as much as some $9.3 million in 2011. But I am interested in setting out a presumption that, at least for the initial 5-year plan period, total spending would not exceed that level.

I should point out that one percent is not a modest level of commitment. Gas utility DSM investment is often relatively less than electric utility investment, perhaps reflecting the nature of cost-effective opportunities in this market. Minnesota is a jurisdiction with long experience with gas DSM, and under its statutes electric utilities are expected to invest at least one and one-half percent of revenues in DSM, while gas utilities are expected to invest at least one-half percent. In acting on the initial PGW plan, the Commission should direct that expenditures for 2011 not exceed one percent of corresponding total operating revenues. In the event the Commission acts now on years subsequent to 2011, the same constraint should be specified.

PROGRAM IMPLEMENTATION SCHEDULE

Q. HAVE YOU REVIEWED THE COMPANY'S SCHEDULE FOR STAGING DEVELOPMENT AND IMPLEMENTATION OF INDIVIDUAL DSM PROGRAMS OVER TIME?

A. Yes, I have. I have reviewed the timelines presented in Table 7 of the DSM Plan. I have no suggestions regarding the proposed timelines for most of the programs. I do have suggestions for modifications to the timelines for some of the individual DSM programs. My suggestions, and the reasons for them, are as follows:

- The Comprehensive Residential Heating Retrofit Program (CRHRP) would provide home energy audits, free CFLs, rebates sufficient to buy down costs for

recommended building and system efficiency improvements to a two-year payback for the participant, and arrangements (as yet uncompleted) for the customer to finance the balance of costs through a third party. Program service delivery is scheduled to commence in the last quarter of 2011, although in a joint petition filed in March the Company and the Clean Air Council proposed to roll it out earlier than that. Even though it would be based on the CWP program, programs such as this are in my view somewhat more difficult to market and deliver than are rebate programs, and utility costs per participant are greater. Moreover, this program requires an adequate infrastructure of delivery vendors in a context where new electric utility energy efficiency programs, expanded weatherization supported by new federal monies, and indeed the Company's own expanded low-income house retrofit program, would all require such program delivery service too. It will be important to first see to it that the CWP can be expanded into the Enhanced Low-Income Retrofit with qualified delivery vendors before launching the CRHRP. Therefore, I recommend that the CRHRP be rolled out at least a quarter-year later than the schedule presently shown.

- The Premium Efficiency Appliances and Heating program would offer rebates to encourage residential and commercial customers to acquire or replace covered equipment to procure high-efficiency equipment. Presently it is scheduled to be rolled out in the third quarter of 2011, according to the Plan timelines. This program affords both residential *and* non-residential customers opportunities to participate in DSM. It is by far the single most cost-effective program in the Plan according to Mr. Plunkett's cost-benefit screening, as shown in Table 8 on page 25 of his pre-filed testimony. Programs such as this are relatively easy to mount. For these reasons, I recommend that it be rolled out at least a quarter-year earlier than the schedule presently shown. I note that delaying the CRHRP somewhat, as I suggested above, would move some $1.4 million in incentive payments from 2011, according to the budgets on page 6 of the PGW DSM Plan. That should facilitate bringing this other program forward.
- Although the Premium Efficiency Appliances and Heating program can serve large numbers of non-residential customers, even more could be served if the

Company rolled out the Commercial and Industrial Retrofit program earlier than 2012 as presently planned. I suggest that, to the extent consistent with the total Plan budget, this program be rolled out during 2011.

While these schedule modifications I suggest may seem minor, I believe they would permit the Company to serve more customers more cost-effectively earlier on, while permitting the entire Plan for 2011 to be delivered within the maximum budget constraint I suggest, namely, costs not in excess of one percent of total revenues.

PROGRAM DESIGN MODIFICATIONS

Q. DO YOU SUGGEST ANY OTHER MODIFICATIONS TO THE COMPANY'S PLAN?

A. Yes. There are two other modifications I recommend, and another I suggest the Company consider. These follow.

- PGW's DSM Plan states, in general terms, PGW's interest in integrating delivery of gas efficiency measures with delivery of electric efficiency measures, or at least in coordinating program design and implementation. Now that PECo has approved DSM programs, the linkages between PGW's efforts and PECo's energy efficiency programs need to be more clear. PGW's DSM Plan needs to be enhanced by describing such coordination as can be achieved more or less immediately. Just as one example, in its CRHRP, PGW might actively enroll eligible participants in PECo's residential Appliance Pickup program. The list of other PECo programs and/or measures which should be explicitly coordinated with appropriate PGW programs includes at least these: the Low-Income Energy Efficiency program's repair of defective gas heaters, the Home Energy Incentives program, Residential New Construction, Commercial & Industrial Equipment

Incentives, Government/Public/Non-Profit facilities (where rolling in PECo incentives might greatly help motivate projects under PGW's corresponding program that has no rebates), and several demand response programs. I recommend that, for its DSM Plan compliance filing in this case, PGW be directed to include a matrix of explicit program coordination linkages and means of exploiting them.

- A different type of coordination issue arises with the Company's plan to install CFLs through both its low-income house retrofit program and its retrofit program for other existing houses. CFLs are of course an electricity saving measure. While house retrofit programs provide useful delivery vehicles for CFL installation, the costs for the CFLs themselves should be borne by the electric utility. If they are not, they should not be included in the programs. Perhaps the Company could strike a suitable reimbursement arrangement with PECo, which is conducting an aggressive CFL program. If not, PECo's CFL program could simply be cross-marketed by PGW.
- In the PGW design of its CRHRP, the initial site visit including the energy audit is entirely free to participants. While this is one approach used in such programs, PECo's similar program requires a customer payment for the audit, and the New Jersey Clean Energy Program's similar program requires a customer payment toward audit costs that is reimbursable if the customer implements recommended efficiency measures. I recommend that PGW assess whether requiring a customer contribution toward the initial home energy audit cost in this program would increase participant "buy-in" and the likelihood of subsequent installation of recommended measures. Any refinements to the design of this program could be presented in a 2011 filing for year 2012 DSM.

Q. DOES THIS COMPLETE YOUR TESTIMONY?

A. Yes, it does.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	:		
	:		
v.	:	Docket Nos.	R-2009-2139884
	:		
Philadelphia Gas Works	:		
Philadelphia Gas Works' Revised Petition	:		
For Approval of Energy Conservation and	:		P-2009-2097639
Demand Side Management	:		

EXHIBITS TO THE

DIRECT TESTIMONY OF

DR. DAVID NICHOLS

ON BEHALF OF THE OFFICE OF CONSUMER ADVOCATE

March 26, 2010

DAVID NICHOLS
PROFESSIONAL BIOGRAPHY

David Nichols is a senior consultant with Synapse Energy Economics of Cambridge, Massachusetts, USA. For 25 years Nichols was a vice president of Tellus Institute in Boston, of which he was a cofounder. Before that he was associate professor at the State University of New York (Albany).

Nichols works throughout the U.S., as well as internationally. His energy work includes efficiency studies, technology assessment, cost benefit analysis, design and evaluation of demand-side load response and efficiency programs, and policy analysis. He has testified before regulatory commissions in the U.S. and Canada on energy efficiency, renewable energy, rate design, performance-based ratemaking, and other issues. Current and recent work includes:

- Consultant to the New Jersey Division of Rate Counsel for: the Renewable Energy Task Force, the Clean Energy Council, the Energy Master Plan, design and administration of renewable energy and energy efficiency programs, and gas and electric utility recovery of demand-side management costs; as well as off-tariff rate applications. This work has included testimony in several Board of Public Utilities dockets.

- Training of midlevel professionals in India and Indonesia on electric resource planning and demand-side management. This work was done for the U.S. Agency for International Development through the Institute of International Education.

- Comprehensive reports on states' policy and regulatory treatment of energy efficiency and renewable energy for the American Council for an Energy-Efficient Economy, the Colorado Governor's Office of Energy Management, E-Source, and others.

- Study of the achievable potential from new electric energy efficiency and load response measures in Utah, completed for an Advisory Group to the Public Service Commission.

- Heading the team that developed performance indicators for the Climate Change programs (renewable energy and energy efficiency) of the Global Environmental Facility.

- Lead author for the World Commission on Dams' *Thematic Review of Planning Approaches*, focusing on enabling participation in multi-stakeholder planning, avoiding adverse impacts though energy and water conservation, and better siting and operating practices.

- Analyses of utility cost recovery and incentives for ratepayer-funded energy efficiency for the Regional Environmental Councils of Quebec, West Kootenay Power Co., Enbridge Gas Ltd., Southern Alliance for Clean Energy, and others, including related testimony before several regulatory commissions.

Nichols has participated in task forces, advisory groups, collaborative processes, workshops, working groups and settlement discussions on oil, gas, and electric energy efficiency, as well as rate design. In these working group processes he assisted such stakeholders as energy utilities, commission staffs, consumer advocates, energy offices, and environmental agencies.

Nichols' articles have appeared in *Electricity Journal*, *Industry and Environment Review*, *Pace Environmental Law Review*, *Polity*, and conference proceedings published by the American Council for an Energy Efficient Economy, Electric Power Research Institute, and others. He was educated at Clark University, the University of Chicago, and Massachusetts Institute of Technology, where he received his Ph.D.

TESTIMONY BEFORE REGULATORY COMMISSIONS

JURISDICTION	APPEARANCES		JURISDICTION	APPEARANCES	
	DSM	Other		DSM	Other
Arizona		1	North Carolina	1	
Colorado	2		Nova Scotia	3	
Connecticut	4	1	Ohio	3	
Delaware	1		Oklahoma		1
US Federal Energy Regulatory Commission	2	2	Ontario	3	1
Kansas		3	Pennsylvania	1	
Maine	3		Rhode Island	1	2
Maryland		1	South Carolina	1	1
Massachusetts	3	1	Texas		2
Missouri		1	Utah	1	2
Nevada		2	Vermont	3	1
New Hampshire		1	Virginia	1	
New Jersey	11	2	Wisconsin	2	
New York	2	3			
				Total DSM 48	Total Other 27

DSM: Demand-side management, including energy conservation, energy efficiency and demand response.

Other: Planning, rate design, other energy analysis.

Table does not include testimony that was filed but not heard.