ORIGINAL

OPEN MEETING
MEMORANDUM

TO: THE COMMISSION

FROM: Utilities Division

DATE: September 5, 2007

RE: SOUTHWEST GAS CORPORATION – APPLICATION FOR APPROVAL OF ITS DISTRIBUTED GENERATION PROGRAM (A DEMAND-SIDE MANAGEMENT PROGRAM) (DOCKET NO. G-01551A-04-0876)

On June 26, 2006, Southwest Gas Corporation ("Southwest") filed an application for approval of its Distributed Generation ("DG") program, as required by Decision No. 68487. Decision No. 68487 required that the Company file detailed descriptions of its demand-side management ("DSM") programs within 120 days of the Commission's February 23, 2006 Order approving rate changes effective March 1, 2006.

The proposed program would be newly-implemented. The DG program is one of seven DSM programs included in Southwest's 2006 Arizona Demand Side Management Program Plan.

Program Description

Under the proposed DG program, Southwest would provide incentives to commercial and industrial customers installing on-site power generation, with a focus on combined heat and power ("CHP") technologies. CHP technologies capture byproduct heat created during electric power generation and use it for heating and cooling, or to generate additional electricity. To be eligible for incentives, a CHP program would have to achieve 60-70% fuel efficiency. Southwest indicates that natural gas savings would be generated through a combination of therms saved on-site through heat recovery and energy saved through avoided electricity transmission and distribution losses ("line losses").[1] Southwest estimates that, under the DG program, from one to four projects will receive incentives each year.

CHP Projects

In order for a CHP project to be cost-effective, a CHP unit must generate the right electrical and thermal loads to meet a specific facility's needs. A primary consideration is whether or not the facility can use the waste heat generated by the CHP unit. For example, at a facility utilizing boilers, heat that would otherwise be wasted would be used, instead, to offset the amount of natural gas needed to run the boilers. Southwest has indicated that the types of facilities that are best able to meet these parameters include the following:

a. Hospitals with central boilers;
b. Hotels and apartments with central boilers;

[1] Lines losses are avoided because of on-site generation.

c. Manufacturing or processing facilities with central boilers or the need for process heat; and
d. Universities/colleges with central heating and cooling.

Other Distributed Generation Projects

Although CHP technologies are the focus of the DG program, Southwest states that peak-shaving and new natural gas technologies may be included as well. (New natural gas technologies would include fuel cells and microturbines.) Neither peak-shaving technologies nor new natural gas technologies would be subject to fuel efficiency standards, but both must displace thermal energy during system operations to be eligible for participation.

Staff Recommendations Regarding Project Types

If the DG program is approved, Staff recommends that Southwest restrict participation to projects that Southwest can demonstrate are cost-effective under the Societal Test, and which offer the greatest potential for natural gas savings, in addition to the kWh savings typically provided by such projects. Given the high cost of DG projects and the individual requirements of each facility seeking to install distributed generation, each project needs to be evaluated to confirm that cost-effective natural gas savings are available. Staff recommends that energy savings from each project be documented and included with Southwest's semi-annual DSM reports.

Staff recommends that peak shaving technologies not be funded through Southwest's DG program; the savings from peak shaving technologies are generally confined to avoided line losses, do not involve heat recovery, and would result in limited or no natural gas savings. Staff also recommends that neither fuel cells nor microturbines be funded through Southwest's DG program at this time. The above technologies may have value as distributed generation, but Staff considers them more as supply resources, rather than as DSM. Another consideration is that Southwest indicates in its program plan that commercial fuel cells and microturbines are more expensive than other distributed generation technologies. In its response to Staff's data requests Southwest goes on to describe these technologies as "generally not cost-effective." Should new technologies become available that would provide natural gas DSM savings in a cost-effective manner, Southwest could submit the programs utilizing these technologies to the Commission for approval.

Target Market and Estimated Levels of Participation

Participation would be restricted to Southwest customers in Arizona. Most participants would be Southwest's general service or transportation tariff customers. Municipalities, schools, restaurants, hospitals, hotels and multi-family buildings are among the customers who could benefit from existing CHP technologies. As stated elsewhere, to benefit economically from installation of a CHP unit, a facility must have a use for the waste heat captured by the CHP unit.

Estimated Participation

Year 1	1-2 installations, 700 kW
Year 2	1-3 installations, 700 kW
Year 3	2-4 installations, 700 kW

Marketing

The DG/CHP program would be marketed primarily through the recently approved Technology Information Center ("TIC") program, as well as through existing Southwest resources. Targeted participants will receive emailed TIC newsletters with information on distributed energy. There will also be direct contacts by Southwest personnel, direct mailings to energy representatives at government facilities, and seminars or workshops.

Incentives

Under the proposed DG program, incentives would be provided to users and developers of CHP and other DG projects. The program incentives are intended to reduce payback investment periods. Below are the incentives proposed by Southwest:

SYSTEMS	INCENTIVES
CHP system with 70% fuel efficiency	$500 per kW, up to 50% of installed cost
CHP system with 65% fuel efficiency	$450 per kW, up to 50% of installed cost
CHP system with 60% fuel efficiency	$400 per kW, up to 50% of installed cost
Peak-shaving systems demonstrating thermal displacement[2]	$400 per kW
New natural gas technologies demonstrating thermal displacement[3]	$400 per kW

Staff recommends that the incentives be reviewed by Southwest no less than annually to determine whether program participation can be maintained with the incentives either reduced or eliminated.

Delivery Strategy

Initial information concerning Southwest's DG program would be emailed, in the TIC newsletter, as stated above. During the implementation process, Southwest Key Account Management engineers would work with the customers, and will verify energy savings and demand reductions. Incentive payments would be processed by Southwest or its contractor, and Southwest Key Account Management engineers would oversee delivery of the incentives. In addition, Southwest would retain the services of a design consultant to perform energy studies. The design consultant would work with Southwest and potential program participants to determine whether proposed projects would be economical.

Monitoring and Evaluation

Southwest will track and verify energy savings and demand reductions resulting from the DG program. Southwest will also track the number of installations and technological information.

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[2] Staff recommends that peak shaving technology projects not be funded through Southwest's DG program.
[3] New natural gas technologies are not recommended for inclusion in Southwest's DG program at this time.

In addition, Staff recommends that energy savings for individual projects be determined and documented, and that this documentation be included in Southwest's semi-annual DSM reports.

Program Budget

Southwest proposes a $400,000 annual budget. Most of the budget is allocated to incentives, while the proposed marketing, administration and implementation costs are comparatively low at 12.5% of the total.

Annual Budget proposed by Southwest, 2007-2009

Category	Amount	Percentage
Implementation: Outside contractors	$ 22,000[4]	5.5%
Communication: Brochures/Printing/Design	$ 8,000	2.0%
Training and Education: Seminars/workshops	$ 10,000	2.5%
Incentives	$350,000	87.5%
Measurement/Evaluation: Outside contractors	$ 8,000	2.0%
Administrative Costs: Office supplies	$ 2,000	0.5%
TOTAL	$400,000	100%

Cost-Benefit Analysis

Southwest supplied a case model, for a 700 kW CHP engine with 50% heat recovery, also assuming a 2,000 kW customer with a 50% load factor, 25,000 therms per month natural gas usage, and a 33% efficient central power plant with 7.5% in line losses. Based on this model, as modified during Staff's analysis, the cost-effectiveness ratio for a project similar to the model would be: 3.79. Staff notes that the benefits and costs of each CHP project would be different and that energy savings, cost-effectiveness or even the overall suitability of a facility for CHP can not be assumed without individual analysis.

Staff Analysis

Although cost-effective, many, if not most, CHP projects would produce significant electric savings at the cost of a net increase in the amount of natural gas used on-site. A natural gas-fueled CHP unit that both generates on-site electricity and saves waste heat for boilers, may use more natural gas to perform these two functions than it saves through capturing the waste heat. A net decrease in the amount of natural gas used on-site is possible in some cases, in addition to the

[4] The Implementation budget covers the cost of energy studies to be done by design consultants. See discussion in this report, under "Delivery Strategy."

electric savings; one example would be a CHP project that replaces incorrectly-sized boilers with boilers appropriate to the facility's needs. As stated earlier, Southwest should select CHP projects that are not only cost-effective, but which demonstrate the greatest potential for natural gas savings, in addition to kWh savings.

Off-site, or system-wide, savings provided by CHP projects should also be taken into account in evaluating CHP projects. Avoided line losses are savings of electricity at the margin, and electric savings at the margin are usually savings of electricity that would have been generated through the burning of natural gas. This means that, on a system-wide basis, on-site generation of electricity through a CHP unit generates natural gas savings as well as electric savings.

Reporting Requirements

Staff recommends that the status of the Distributed Generation program, and the documented energy savings for each funded project, be reported in Southwest's semi-annual DSM reports. The information should include: (i) the number of installations; (ii) a description of the specific project or projects; (iii) energy savings in therms and kWh, both on-site and from transmission and distribution savings; (iv) demand reductions resulting from the project or projects; and (v) the results of Southwest's incentive review.

Environmental Benefits

Environmental benefits for each CHP project will vary according to facility and project. Southwest estimated environmental benefits for a 700 kW CHP project, which Staff has modified based on its research. Staff research indicates that emission savings from CHP projects are generally very large on a per-project basis.

ENVIRONMENTAL BENEFITS

Annual Savings	CO_2 (lbs)	NO_x (lbs)	SO_x (lbs)
2007	2,545,453	477	12
2008	2,545,453	477	12
2009	2,545,453	477	12
Lifetime Savings	152,727,160	28,620	720

Other Benefits

Because they are on-site, CHP projects are less vulnerable to outages and increase the reliability of the energy supply for the facilities where they are located. In addition, each CHP project, by reducing overall demand, contributes to the reliability of local electrical grids.

Summary of Staff Recommendations

- Staff recommends that Southwest restrict participation to projects that Southwest can demonstrate are cost-effective under the Societal Test, and which offer the greatest potential for natural gas savings, in addition to the kWh savings typically provided by such projects.

- Staff recommends that peak shaving technologies not be funded through Southwest's DG program.

- Staff also recommends that neither fuel cells nor microturbines be funded through Southwest's DG program at this time.

- Staff recommends that the incentives be reviewed by Southwest no less than annually to determine whether program participation can be maintained with the incentives either reduced or eliminated.

- Staff recommends that the status of the DG program, and the documented energy savings for each funded project, be reported in Southwest's semi-annual demand-side management reports. The information should include: (i) the number of installations; (ii) a description of the specific project or projects; (iii) energy savings in therms and kWh, both on-site and from transmission and distribution savings; (iv) demand reductions resulting from the project or projects; and (v) the results of Southwest's incentive review.

for Ernest G. Johnson
Director
Utilities Division

EGJ:JMK:tdp\JMA

ORIGINATOR: Julie McNeely-Kirwan

BEFORE THE ARIZONA CORPORATION COMMISSION

MIKE GLEASON
Chairman
WILLIAM A. MUNDELL
Commissioner
JEFF HATCH-MILLER
Commissioner
KRISTEN K. MAYES
Commissioner
GARY PIERCE
Commissioner

IN THE MATTER OF THE APPLICATION OF SOUTHWEST GAS CORPORATION – FILING FOR APPROVAL OF ITS DISTRIBUTED GENERATION PROGRAM	DOCKET NO. G-01551A-04-0876 DECISION NO. _____ ORDER

Open Meeting
September 18 and 19, 2007
Phoenix, Arizona

BY THE COMMISSION:

FINDINGS OF FACT

1. Southwest Gas Corporation ("Southwest") is engaged in providing natural gas within portions of Arizona, pursuant to authority granted by the Arizona Corporation Commission.

2. On June 26, 2006, Southwest Gas Corporation ("Southwest") filed an application for approval of its Distributed Generation ("DG") program, as required by Decision No. 68487. Decision No. 68487 required that the Company file detailed descriptions of its demand-side management programs within 120 days of the Commission's February 23, 2006 Order approving rate changes effective March 1, 2006.

3. The proposed program would be newly-implemented. The DG program is one of seven DSM programs included in Southwest's 2006 Arizona Demand Side Management Program Plan.

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4. Under the proposed DG program, Southwest would provide incentives to commercial and industrial customers installing on-site power generation with a focus on combined heat and power ("CHP") technologies. CHP technologies capture byproduct heat created during electric power generation and use it for heating and cooling, or to generate additional electricity. To be eligible for incentives, a CHP program would have to achieve 60-70% fuel efficiency. Southwest indicates that natural gas savings would be generated through a combination of therms saved on-site through heat recovery and energy saved through avoided electricity transmission and distribution losses ("line losses").[1] Southwest estimates that, under the DG program, from one to four projects will receive incentives each year.

5. In order for a CHP project to be cost-effective, a CHP unit must generate the right electrical and thermal loads to meet a specific facility's needs. A primary consideration is whether or not the facility can use the waste heat generated by the CHP unit. For example, at a facility utilizing boilers, heat that would otherwise be wasted would be used, instead, to offset the amount of natural gas needed to run the boilers. Southwest has indicated that the types of facilities that are best able to meet these parameters include the following:

a. Hospitals with central boilers;

b. Hotels and apartments with central boilers;

c. Manufacturing or processing facilities with central boilers or the need for process heat; and

d. Universities/colleges with central heating and cooling.

6. Although CHP technologies are the focus of the DG program, Southwest states that peak-shaving and new natural gas technologies may be included as well. (New natural gas technologies would include fuel cells and microturbines.) Neither peak-shaving technologies nor new natural gas technologies would be subject to fuel efficiency standards, but both must displace thermal energy during system operations to be eligible for participation.

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[1] Lines losses are avoided because of on-site generation.

7. If the DG program is approved, Staff has recommended that Southwest restrict participation to projects that Southwest can demonstrate are cost-effective under the Societal Test, and which offer the greatest potential for natural gas savings, in addition to the kWh savings typically provided by such projects. Given the high cost of DG projects and the individual requirements of each facility seeking to install distributed generation, each project needs to be evaluated to confirm that cost-effective natural gas savings are available. Staff has recommended that energy savings from each project be documented and included with Southwest's semi-annual DSM reports.

8. Staff has recommended that peak shaving technologies not be funded through Southwest's DG program; the savings from peak shaving technologies are generally confined to avoided line losses, do not involve heat recovery, and would result in limited or no natural gas savings. Staff also recommends that neither fuel cells nor microturbines be funded through Southwest's DG program at this time. The above technologies may have value as distributed generation, but Staff considers them more as supply resources, rather than as DSM. Another consideration is that Southwest indicates in its program plan that commercial fuel cells and microturbines are more expensive than other distributed generation technologies. In its response to Staff's data requests Southwest goes on to describe these technologies as "generally not cost-effective." Should new technologies become available that would provide natural gas DSM savings in a cost-effective manner, Southwest could submit the programs utilizing these technologies to the Commission for approval.

9. Participation would be restricted to Southwest customers in Arizona. Most participants would be Southwest's general service or transportation tariff customers. Municipalities, schools, restaurants, hospitals, hotels and multi-family buildings are among the customers who could benefit from existing CHP technologies. As stated elsewhere, to benefit economically from installation of a CHP unit, a facility must have a use for the waste heat captured by the CHP unit.

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10. The DG/CHP program would be marketed primarily through the recently approved Technology Information Center ("TIC") program, as well as through existing Southwest resources. Targeted participants will receive emailed TIC newsletters with information on distributed energy. There will also be direct contacts by Southwest personnel, direct mailings to energy representatives at government facilities, and seminars or workshops.

11. Under the proposed DG program, incentives would be provided to users and developers of CHP and other DG projects. The program incentives are intended to reduce payback investment periods. Below are the incentives proposed by Southwest:

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CHP system with 60% fuel efficiency	$400 per kW, up to 50% of installed cost
Peak-shaving systems demonstrating thermal displacement2	$400 per kW
New natural gas technologies demonstrating thermal displacement3	$400 per kW

12. Staff has recommended that the incentives be reviewed by Southwest no less than annually to determine whether program participation can be maintained with the incentives either reduced or eliminated.

13. Initial information concerning Southwest's DG program would be emailed, in the TIC newsletter, as stated above. During the implementation process, Southwest Key Account Management engineers would work with the customers, and will verify energy savings and demand reductions. Incentive payments would be processed by Southwest or its contractor, and Southwest Key Account Management engineers would oversee delivery of the incentives. In addition, Southwest would retain the services of a design consultant to perform energy studies. The design consultant would work with Southwest and potential program participants to determine whether proposed projects would be economical.

[2] Staff has recommended that peak shaving technology projects not be funded through Southwest's DG program.
[3] New natural gas technologies are not recommended for inclusion in Southwest's DG program at this time.

14. Southwest will track and verify energy savings and demand reductions resulting from the DG program. Southwest will also track the number of installations and technological information. In addition, Staff has recommended that energy savings for individual projects be determined and documented, and that this documentation be included in Southwest's semi-annual DSM reports.

15. Southwest proposes a $400,000 annual budget. Most of the budget is allocated to incentives, while the proposed marketing, administration and implementation costs are comparatively low at 12.5% of the total.

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16. Southwest supplied a case model, for a 700 kW CHP engine with 50% heat recovery, also assuming a 2,000 kW customer with a 50% load factor, 25,000 therms per month natural gas usage, and a 33% efficient central power plant with 7.5% in line losses. Based on this model, as modified during Staff's analysis, the cost-effectiveness ratio for a project similar to the model would be: 3.79. Staff notes that the benefits and costs of each CHP project would be different and that energy savings, cost-effectiveness or even the overall suitability of a facility for CHP can not be assumed without individual analysis.

17. Although cost-effective, many, if not most, CHP projects would produce significant electric savings at the cost of a net increase in the amount of natural gas used on-site. A natural gas-fueled CHP unit that both generates on-site electricity and saves waste heat for boilers, may use more natural gas to perform these two functions than it saves through capturing the waste heat.

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A net decrease in the amount of natural gas used on-site is possible in some cases, in addition to the electric savings; one example would be a CHP project that replaces incorrectly-sized boilers with boilers appropriate to the facility's needs. As stated earlier, Southwest should select CHP projects that are not only cost-effective, but which demonstrate the greatest potential for natural gas savings, in addition to kWh savings.

18. Off-site, or system-wide, savings provided by CHP projects should also be taken into account in evaluating CHP projects. Avoided line losses are savings of electricity at the margin, and electric savings at the margin are usually savings of electricity that would have been generated through the burning of natural gas. This means that, on a system-wide basis, on-site generation of electricity through a CHP unit generates natural gas savings as well as electric savings.

19. Staff has recommended that the status of the DG program, and the documented energy savings for each funded project, be reported in Southwest's semi-annual DSM reports. The information should include: (i) the number of installations; (ii) a description of the specific project or projects; (iii) energy savings in therms and kWh, both on-site and from transmission and distribution savings; (iv) demand reductions resulting from the project or project; and (v) the results of Southwest's incentive review.

20. Environmental benefits for each CHP project will vary according to facility and project. Southwest estimated environmental benefits for a 700 kW CHP project, which Staff has modified based on its research. Staff research indicates that emission savings from CHP projects are generally very large on a per-project basis.

ENVIRONMENTAL BENEFITS

Annual Savings	CO_2 (lbs)	NO_x (lbs)	SO_x (lbs)
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2009	2,545,453	477	12
Lifetime Savings	152,727,160	28,620	720

21. Because they are on-site, CHP projects are less vulnerable to outages and increase the reliability of the energy supply for the facilities where they are located. In addition, each CHP project, by reducing overall demand, contributes to the reliability of local electrical grids.

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Summary of Staff Recommendations

22. Staff has recommended that Southwest restrict participation to projects that Southwest can demonstrate are cost-effective under the Societal Test, and which offer the greatest potential for natural gas savings, in addition to the kWh savings typically provided by such projects.

23. Staff has recommended that peak shaving technologies not be funded through Southwest's DG program; the savings from peak shaving technologies are generally confined to avoided line losses, do not involve heat recovery, and would result in limited or no natural gas savings. Staff also recommends that neither fuel cells nor microturbines be funded through Southwest's DG program at this time. The above technologies may have value as DG, but Staff considers them more as supply resources, rather than as DSM. Another consideration is that Southwest indicates in its program plan that commercial fuel cells and microturbines are more expensive than other distributed generation technologies. In its response to Staff's data requests Southwest goes on to describe these technologies as "generally not cost-effective." Should new technologies become available that would provide natural gas DSM savings in a cost-effective manner, Southwest could submit the programs utilizing these technologies to the Commission for approval.

24. Staff has recommended that the incentives be reviewed by Southwest no less than annually to determine whether program participation can be maintained with the incentives either reduced or eliminated.

25. Staff has recommended that the status of the DG program, and the documented energy savings for each funded project, be reported in Southwest's semi-annual DSM reports. The information should include: (i) the number of installations; (ii) a description of the specific project or projects; (iii) energy savings in therms and kWh, both on-site and from transmission and distribution savings; (iv) demand reductions resulting from the project or projects; and (v) the results of Southwest's incentive review

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CONCLUSIONS OF LAW

1. Southwest is an Arizona public service corporation within the meaning of Article XV, Section 2, of the Arizona Constitution.

2. The Commission has jurisdiction over Southwest and over the subject matter of the application.

3. The Commission, having reviewed the application and Staff's Memorandum dated September 5, 2007, concludes that it is in the public interest to approve the DG program.

ORDER

IT IS THEREFORE ORDERED that the DG program be and hereby is approved, as recommended by Staff.

IT IS FURTHER ORDERED that Southwest restrict participation to projects that it can demonstrate are cost-effective under the Societal Test, and which offer the greatest potential for natural gas savings, in addition to the kWh savings typically provided by such projects.

IT IS FUTHER ORDERED that peak shaving technologies not be funded through Southwest's DG program.

IT IS FURTHER ORDERED that neither fuel cells nor microturbines be funded through Southwest's DG program at this time.

IT IS FURTHER ORDERED that the incentives be reviewed by Southwest no less than annually to determine whether program participation can be maintained with the incentives either reduced or eliminated.

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IT IS FURTHER ORDERED that the status of the DG program, and the documented energy savings for each funded project, be reported in Southwest's semi-annual DSM reports. The information should include: (i) the number of installations; (ii) a description of the specific project or projects; (iii) energy savings in therms and kWh, both on-site and from transmission and distribution savings; (iv) demand reductions resulting from the project or projects; and (v) the results of Southwest's incentive review.

IT IS FURTHER ORDERED that this Decision shall become effective immediately.

BY THE ORDER OF THE ARIZONA CORPORATION COMMISSION

CHAIRMAN COMMISSIONER

COMMISSIONER COMMISSIONER COMMISSIONER

IN WITNESS WHEREOF, I DEAN S. MILLER, Interim Executive Director of the Arizona Corporation Commission, have hereunto, set my hand and caused the official seal of this Commission to be affixed at the Capitol, in the City of Phoenix, this _____day of _____, 2007.

_____
DEAN S. MILLER
Interim Executive Director

DISSENT: _____

DISSENT: _____

EGJ:JMK:tdp\JMA

SERVICE LIST FOR: Southwest Gas Corporation
DOCKET NO. G-01551A-04-0876

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