Thomas R. Teehan
Senior Counsel

September 28, 2009

VIA HAND DELIVERY & ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

RE: Docket 4077 - Distribution Adjustment Charge 2009
Responses to Division Data Requests - Set 3

Dear Ms. Massaro:

Enclosed please find ten (10) copies of National Grid's[1] responses to the Division of Public Utilities and Carrier's ("Division") Third Set of Data Requests issued on September 22, 2009 in the above-captioned proceeding.

Thank you for your attention to this transmittal. If you have any questions, please feel free to contact me at (401) 784-7667.

Very truly yours,

Thomas R. Teehan

Enclosures
cc: Docket 4077 Service List
Steve Scialabba, Division

[1] Submitted on behalf of The Narragansett Electric Company d/b/a National Grid

280 Melrose Street, Providence, RI 02907
T: 401-784-7667 ■ F: 401-784-4321 ■ thomas.teehan@us.ngrid.com ■ www.nationalgrid.com

Certificate of Service

I hereby certify that a copy of the cover letter and / or any materials accompanying this certificate has been electronically transmitted, sent via U.S. mail or hand-delivered to the individuals listed below.

_____ September 28, 2009

Joanne M. Scanlon Date

Docket No. 4077 – National Grid – Annual Distribution Adjustment Clause Filing ("DAC") - Service List as of 8/5/09

Name/Address	E-mail	Phone/FAX
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File an original & nine (9) copies w/: Luly E. Massaro, Commission Clerk Public Utilities Commission 89 Jefferson Blvd. Warwick RI 02888	Lmassaro@puc.state.ri.us plucarelli@puc.state.ri.us sccamara@puc.state.ri.us	401-780-2107 401-941-1691
John Farley, TEC-RI	Jfarley316@hotmail.com	401-621-2240

Division Data Request 3-1

Request:

Please document and explain in detail the causes of the significant changes in projected "Withdrawal Commodity" costs for the months of December 2009, January 2010, and February 2010 that are reflected in Attachment JFN-2S.

Response:

The "Withdrawal Commodity" costs for the months of December 2009, January 2010, and February 2010 reflected in Attachment JFN-2S are based on and tie to the costs developed as part of the Company's annual Gas Cost Recovery (GCR) filing which was made on September 1, 2009 and assigned Docket No. 4097. The demand forecast, storage inventories, gas pricing and Sendout model run underlying those costs was not available at the time the August 1 DAC filing was prepared and hence, the Company's August 1st DAC filing was based on preliminary estimates as indicated in the testimony of John F. Nestor (see Nestor Testimony pg 3, and Attachment JFN-1, fn). The changes are the results of different demand forecasts and LNG dispatch projections.

Prepared by or under the supervision of: John F. Nestor, III and Gary Beland

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Division Data Request 3-2

Request:

Please provide the Company's current best estimates of the On-System Revenue Margins and margin credits that will be experienced during the November 2009 – October 2010 GCR period

Response:

At this time, the Company has not developed a forecast of usage or margins for the customers included in the On-System Margin calculation for the November 2009-October 2010 GCR period.

Prepared by or under the supervision of: John F. Nestor, III

Division Data Request 3-3

Request:

Please explain why the insurance proceeds in the amount of $878,994 that are document by the check and transmittal letter attached to the Company's response to Division Data Request 2-6.b are not reflected in either Attachment JFN-4 or JFN-4S.

Response:

The information of the insurance proceeds was discovered during a review of accounting records in response to the Division Data Request 2-6 and should have been reflected in the Attachment to JFN-4 and Attachment JFN-4S. Upon receipt, the insurance check was held by the Company's Legal Department until such time that the Company received additional information from Southern Union concerning the matter covered by the proceeds. At the time of the filing of Attachment JFN-4 and JFN-4S, Mr. Nestor was unaware that the Legal Department had received the information from Southern Union and released the check.

Prepared by or under the supervision of: John F. Nestor, III and Michelle Leone

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Division Data Request 3-4

Request:

Please provide data in the format of that presented in Attachment to DIV 2-9(a) for the months of November 2008 through June 2009.

Response:

As shown in schedule JFN-7S of the Supplemental Filing on September 1, 2009, pages 4-18, the gas costs billed to customers is the product of the metered use and the gas cost rate. Attached are the schedules showing the calculation of the gas cost rate used in each month for November and December 2008, and January through June 2009.

Prepared by or under the supervision of: John F. Nestor, III

	Nov-08	
Columbia Supply (Appalachia) - AGT	**$6.6790**	per Dth
Commodity on TCO	0.0167	
Commodity on AGT	0.0131	
Fuel on TCO	1.989%	
Fuel on AGT	0.61%	
Total Delivered to City Gate	**6.8863**	per Dth
Unaccounted for factor	2.34%	
Gas Cost at Customer	**$7.0513**	per Dth

	Dec-08	
TENNESSEE ZN 1 500 leg	**$6.8380**	per Dth
Commodity to zone 6	0.1522	
Fuel to zone 6	6.67%	
Total Delivered to City Gate	**7.4789**	per Dth
Unaccounted for factor	2.34%	
Gas Cost at Customer	**$7.6581**	per Dth

	Jan-09	
NYMEX settled price (12/22/08)	$5.2940	
Transco Zone 6 Basis Swap	$3.3050	
Subtotal	$8.5990	
Rate with margin @ 110%	$9.4589	
RATE WITH LINE LOSS @ 2.34%	**$9.6855**	per Dth

	Feb-09	
NYMEX settled price (01/23/09)	$4.5180	
Transco Zone 6 Basis Swap	$3.1750	
Subtotal	$7.6930	
Rate with margin @ 110%	$8.4623	
RATE WITH LINE LOSS @ 2.34%	**$8.6651**	per Dth

	Mar-09	
NYMEX settled price (02/12/09)	$4.4850	
Transco Zone 6 Basis Swap	$1.0750	
Subtotal	$5.5600	
Rate with margin @ 110%	$6.1160	
RATE WITH LINE LOSS @ 2.34%	**$6.2625**	per Dth

	Apr-09	
NYMEX settled price (03/17/09)	$3.8120	
Transco Zone 6 Basis Swap	$0.4825	
Subtotal	$4.2945	
Rate with margin @ 110%	$4.7240	
RATE WITH LINE LOSS @ 2.34%	**$4.8371**	per Dth

	May-09	
NYMEX settled price (04/16/09)	$3.5990	
Transco Zone 6 Basis Swap	$0.4725	
Subtotal	$4.0715	
Rate with margin @ 110%	$4.4787	
RATE WITH LINE LOSS @ 2.34%	**$4.5860**	per Dth

	Jun-09	
NYMEX settled price (05/14/09)	$4.2920	
Transco Zone 6 Basis Swap	$0.5200	
Subtotal	$4.8120	
Rate with margin @ 110%	$5.2932	
RATE WITH LINE LOSS @ 2.34%	**$5.4200**	per Dth

Division Data Request 3-5

Request:

Please provide the Company's supporting workpapers and documentation for the determination of the current year pension expense and PBOP expense in Attachment JFN-5S pages 2 and 3.

Response:

Please see the Company's responses to Division Data Requests DIV 2-4 and DIV 2-5.

Prepared by or under the supervision of: William R. Richer

Division Data Request 3-6

Request:

Please provide the Company's rationale and justification for its inclusion of Service Company Pension and PBOP expenses in the Current Year actual amounts for those expense items.

Response:

The Company described how the pension and PBOP reconciliation mechanism would operate in the testimony of Michael D. Laflamme in Docket No. 3943. Inclusion of service company pension and PBOP costs in the reconciliation is specifically referred to in this testimony. The following is taken from page 49 of 60 of Mr. Laflamme's testimony describing the reconciliation mechanism:

"In terms of pensions, the reconciliation begins with the pension O&M rate allowance, including Service Company-allocated expense, as will be determined in this proceeding, as shown in Column (a) on Attachment NG-MDL-3 on Lines 2 through 4."

In addition, a line item for service company costs is displayed on the aforementioned Attachment NG-MDL-3 which has been included as an attachment to this response.

Prepared by or under the supervision of: William R. Richer

Division Data Request 3-7

Request:

Re: the Supplemental Testimony of witness Nestor and the Company's response to Division Data Request DIV 2-2.

a) Please provide the cost-benefit analyses upon which the Company relies to justify the level of the AGT rebate that the Company expects to pay to the customer to whom the e-mail and letter attached to Division Data Request DIV 2-2 relate.

b) Please explain why witness Nestor's supplemental testimony suggests that an "*AGT rebate, which could exceed $1 million*" when the e-mail attached to Division Data Request DIV 2-2 refers to a project rebate of "*up to $500,000*."

c) Please provide any evidence that this project would not be built in the absence of an AGT rebate from National Grid.

d) Please provide copies of all agreements that the Company would require of the customer to obtain an AGT rebate for the referenced project.

e) Please explain who would pay the "*study rebate of up to $10,000.00*" that is referenced in the e-mail attached to Division Data Request DIV 2-2 and indicate when and under what conditions that rebate would be paid.

Response:

a) The cost benefit analyses that the Company has prepared to estimate the general level of a potential rebate is based upon the information provided in the letter provided in the Company's Reply to Division Data Request DIV 2-2, as well as meetings and discussions by the Company's marketing and sales personnel with the customer regarding the feasibility study conducted by its consultant, Solar Turbine, for a CHP Cogeneration Plant. A copy of that analysis is attached. As stated in DIV 2-2, the Company is still discussing and working with the customer to clarify certain parts of the proposed project. At this time, the customer has not finalized which option its will undertake nor has the Company proposed any specific level of rebate for the project. Rather the request to increase the AGT recovery by $300,000 recognizes that a CHP project of the size and scope currently under review potentially would qualify for an AGT rebate in excess of the $715,000 currently available. Increasing the AGT rebate will provide the Company additional flexibility to offer the customer a specific incentive for its Cogeneration project once the decision is

Division Data Request 3-7 (cont.)

made by the customer as to which project its will undertake. Once the customer files the formal application for an AGT rebate, then a specific rebate can be determined by the Company. Since the size and scope of the project will exceed the $50,000 threshold, the Company will review that documentation with the Division and TEC-RI at the appropriate time.

b) It is the Company's understanding that the reference to $500,000 by the customer is incorrect and the customer meant to reference the $50,000 threshold requirement for the AGT program note above in (a).

c) The Company does not know which factors the customer will utilize in reaching a decision to build its cogeneration plant. However, from discussions with the customer and the general economic conditions, the Company is aware that money for spending on capital projects is tight and as noted in the customer's letter provided in the Company Reply to Division 2-2 the level of a potential AGT rebate is a major incentive in the customer's decision making process for a cogeneration plant, as well as which option it will pursue. In addition, the fact that the customer has already spent funding for a detailed feasibility study is evidence that at this time the customer is actively evaluating the project and plans to seek AGT rebate funding.

d) The attached documentation outlines the specific information that is required from the customer as part of the AGT rebate process.

e) The study rebate of $10,000 reference in the e-mail relates to a multi-state energy efficiency program that provides funding to help cover the cost of an energy efficiency engineering study undertaken to verify the efficiency savings. A copy of the program application and description is provided as an Attachment to DIV 3-7 (e). This is a separate program that is not related to the AGT rebate program.

Prepared by or under the supervision of: Mark DiPetrillo and John F. Nestor, III

National Grid - Rhode Island
Advanced Gas Technology (AGT) Program
Financial Analysis

Inputs for IRP Financial Analysis

Date:	06/30/2009
Customer Name:	XXXXXXXXXX
Address:	XXXXXXXXXX
Account # :	XXXXXXXXXX
Equipment Type	CHP Cogen Plant - 9.0 MW
Equipment Life (years)	25
Current gas load saved due to heat recovery (Th)	
MADQ - Current:	29,085 Th
- Proposed:	35,181 Th

	Gas Project	Alternate Project
Capital Cost	$18,461,000	$1,600,000
Operating Cost	-$105,142	$0

Results of Analysis

Incremental Distribution Margin per Year	$ 383,055
Net Present Value based on equipment life	$ 3,944,088
Rebate based on 75% of NPV	$ 2,958,066 = REBATE
Rebate based on 75% of Capital Cost Difference	$ 12,645,750
Rebate resulting in 1.5 year Simple Payback	$ 16,703,287

Rate Classification:

Current: EXTRA LARGE LOW LOAD FACTOR
Proposed: EXTRA LARGE HIGH LOAD FACTOR

Month	Current Load (Th)	Proposed Load (Th)	Adjustment to current for Heat Recovery	Adjusted	
Jan	901,632	1,090,624		188,992	
Feb	709,474	973,972		264,498	
Mar	776,755	1,047,051		270,296	
Apr	470,376	802,147		331,770	
May	370,435	705,062		334,627	
Jun	0	619,290		619,290	
Jul	0	639,940		639,940	
Aug	0	639,940		639,940	
Sep	0	619,290		619,290	
Oct	274,414	897,664		623,250	
Nov	441,825	860,477		418,652	
Dec	815,084	1,056,488		241,404	
TOTAL	4,759,996	9,951,944	0	5,191,948	0
			Net Incremental Load	**5,191,948**	

National Grid
Rhode Island - Gas

AGT REBATE ANALYSIS

MARGIN CALCULATION

Firm Sales Service

vanced Gas Technology (AGT) Program

Rates for Effect Dec 1, 2008

	Customer Charge (Monthly)	Demand Rate (MADQ Th)	Distribution $ Head (Th)	Distribution $ Tail (Th)	Embedded Gas Cost	Head Margin (per Th)
SMALL LOW LOAD FACTOR	$ 18.60	$ -	$ 0.4845	$ 0.2600	$ -	$ 0.4845
SMALL HIGH LOAD FACTOR	$ 18.60	$ -	$ 0.4845	$ 0.2600	$ -	$ 0.4845
MEDIUM LOW LOAD FACTOR	$ 60.00	$ 1.2000	$ 0.1603	$ -	$ -	**$ 0.1603**
MEDIUM HIGH LOAD FACTOR	$ 60.00	$ 1.2000	$ 0.1603	$ -	$ -	**$ 0.1603**
LARGE LOW LOAD FACTOR	$ 120.00	$ 1.2000	$ 0.1638	$ -	$ -	**$ 0.1638**
LARGE HIGH LOAD FACTOR	$ 120.00	$ 1.6600	$ 0.0894	$ -	$ -	**$ 0.0894**
EXTRA LARGE LOW LOAD FACTOR	$ 300.00	$ 1.2000	$ 0.0348	$ -	$ -	**$ 0.0348**
EXTRA LARGE HIGH LOAD FACTOR	$ 300.00	$ 1.6600	$ 0.0268	$ -	$ -	**$ 0.0268**

Calculation of Current Distribution Margin

MADQ-Current (Th) 29,085

Month	Current (Th)	Customer Charge	Demand	Distribution $ M, L, XL	Distribution $ Small Low	Distribution $ Small High	TOTAL MARGIN
Jan	901,632	$ 300	$ 34,902	$ 31,377	-	-	$ 66,579
Feb	709,474	$ 300	$ 34,902	$ 24,690	-	-	$ 59,892
Mar	776,755	$ 300	$ 34,902	$ 27,031	-	-	$ 62,233
Apr	470,376	$ 300	$ 34,902	$ 16,369	-	-	$ 51,571
May	370,435	$ 300	$ 34,902	$ 12,891	-	-	$ 48,093
Jun	0	$ 300	$ 34,902	$ 0	-	-	$ 35,202
Jul	0	$ 300	$ 34,902	$ 0	-	-	$ 35,202
Aug	0	$ 300	$ 34,902	$ 0	-	-	$ 35,202
Sep	0	$ 300	$ 34,902	$ 0	-	-	$ 35,202
Oct	274,414	$ 300	$ 34,902	$ 9,550	-	-	$ 44,752
Nov	441,825	$ 300	$ 34,902	$ 15,376	-	-	$ 50,577
Dec	815,084	$ 300	$ 34,902	$ 28,365	-	-	$ 63,567
TOTAL	4,759,996	$ 3,600	$ 418,823	$ 165,648	$ 0	$ 0	$ 588,071

average distribution margin / Th $ 0.124

Off Peak=May-Oct 644,850 Rate Classification 7 EXTRA LARGE LOW LOAD FACTOR
Off Peak / Total 14% Load Factor 0

Calculation of Proposed Distribution Margin

MADQ-Proposed (Th) 35,181

Month	Proposed (Th)	Customer Charge	Demand	Distribution $ M, L, XL	Distribution $ Small Low	Distribution $ Small High	TOTAL MARGIN
Jan	1,090,624	$ 300	$ 58,401	$ 29,229	-	-	$ 87,930
Feb	973,972	$ 300	$ 58,401	$ 26,102	-	-	$ 84,804
Mar	1,047,051	$ 300	$ 58,401	$ 28,061	-	-	$ 86,762
Apr	802,147	$ 300	$ 58,401	$ 21,498	-	-	$ 80,199
May	705,062	$ 300	$ 58,401	$ 18,896	-	-	$ 77,597
Jun	619,290	$ 300	$ 58,401	$ 16,597	-	-	$ 75,298
Jul	639,940	$ 300	$ 58,401	$ 17,150	-	-	$ 75,852
Aug	639,940	$ 300	$ 58,401	$ 17,150	-	-	$ 75,852
Sep	619,290	$ 300	$ 58,401	$ 16,597	-	-	$ 75,298
Oct	897,664	$ 300	$ 58,401	$ 24,057	-	-	$ 82,759
Nov	860,477	$ 300	$ 58,401	$ 23,061	-	-	$ 81,762
Dec	1,056,488	$ 300	$ 58,401	$ 28,314	-	-	$ 87,015
TOTAL	9,951,944	$ 3,600	$ 700,814	$ 110,448	$ 0	$ 0	$ 971,126

average distribution margin / Th $ 0.098

Off Peak=May-Oct (Th) 4,121,186 Rate Classification 8 EXTRA LARGE HIGH LOAD FACTOR
Off Peak / Total 41% Load Factor 1

National Grid
Rhode Island - Gas

AGT Rebate Calculatons

Backup Worksheet

Advanced Gas Technology (AGT) Program

75% of the difference between the Base and Alternate Energy Projects' capital costs

= ($18,461,000) - ($1,600,000) x 75%

= **$12,645,750** - $0 = **$12,645,750**
Constr Cost

An amount resulting in a simple payback of 1.5 years

= ($18,461,000 - $1,600,000) / ($0 - -$105,142)

= $16,861,000 / $105,142

= 160.364079 years = Simple payback of Base Energy Project

Rebate Amount

= (160.364079 - 1.5) x ($0 - -$105,142)

= 158.864079 x $105,142

= **$16,703,287** - $0 = **$16,703,287**
Constr Cost

=

THE NEW ENGLAND GAS COMPANY
RHODE ISLAND ONLY
DEMAND SIDE MANAGEMENT PROGRAM
JULY 1, 2006 THROUGH JUNE 30, 2007

PROGRAM INFORMATION FOR
COMMERCIAL & INDUSTRIAL CUSTOMERS

TABLE OF CONTENTS

July 2006

Dear Valued Customer:

Welcome to The New England Gas Company's Demand Side Management program for our Commercial and Industrial customers. The Demand Side Management (DSM) program influences the demand for natural gas during certain months of the year to improve the utilization of the distribution system and thereby lower the average, unit cost of natural gas supply services to all firm customers. This program is based upon adding natural gas load, rather than reducing load through conservation efforts.

Over the years of successful DSM programs, customers have determined the single most important benefit to them (relating to an Energy Project) is the reduction of capital cost. Therefore, the New England Gas program is identical to other New England utilities' programs by virtue of its one-time, cash payment (i.e., rebate) to customers willing to install and operate natural gas technologies for their businesses in a certain way.

We are pleased to offer a program that helps you implement cost effective natural gas technologies to reduce your company's total energy cost. This document is designed to assist you in understanding the purpose, scope and administration of the Demand Side Management program. It attempts to clearly explain the program and answer any questions you may have at your leisure. If it does not, please contact our Demand Side Management Administrator at (401) 574-2061.

Very truly yours,

Mark DiPetrillo
Manager, Key Accounts

II. PROGRAM OVERVIEW

This section is a quick, introductory guide to the New England Gas Company's (NEGAS) Demand Side Management (DSM) program.

- ***Business Customers with energy Projects located within New England Gas' Rhode Island service area are eligible to receive DSM rebates.***
- ***The DSM program is based on adding natural gas load; not conservation.***
- ***First program year ended on June 30, 2001.***
- ***$300,000 in rebates available each year of the program.***
- ***Rebates of up to $50,000 per customer in any single program year[1].***
- ***All projects and technologies are eligible providing they use more than 31% of natural gas in summer months (i.e., May - October) compared to the total year (i.e. September - August).***

Common natural gas technologies and applications typically meeting the eligibility criteria are listed below. The list depicted below is not inclusive, it simply serves as an illustration of some technologies generally meeting the criteria due to typical operational schedules. There may be many others not listed below. It is important to note the award and rebate amount determination are not dependent upon which technology is used, but rather on the natural gas load profile and economics resulting from any kind of natural gas technology.

TECHNOLOGY	APPLICATION
Air Compressor	Product cooling or movement
Compressed Natural Gas	Personal or fleet cars and trucks
Engine-Driven Pump	Municipal water pumping
Convection Oven & Burner	Curing, drying and forming
Absorption/Engine Driven Chiller	Office air conditioning or process cooling
Desiccant Dehumidifier	Office or process dehumidification
Engine-Driven Generator	Cogeneration
Catalytic Infra-Red Heater	Curing, drying and forming
Incinerator	Solid waste or air pollutant destruction
Boiler & Burner	Process heating (i.e., steam, hot water, etc.)

[1] *Rebates greater than $50,000 per customer per year are allowed under certain circumstances. These instances are handled on a case-by-case basis. For more information, please contact our DSM Administrator.*

- **Eligible Energy Projects must:**

  1. Be located within New England Gas' Rhode Island service area;

  2. Result in incremental natural gas load relative to previous years after normalizing for weather;

     This ensures the Energy Project provides benefits through added load. This is important, because the basis for the DSM program is the increased utilization of existing fixed resources like mains, services, and year-round supply contracts.

  3. Use more than 31% of its natural gas in the months of May through October, when compared to the months of September through August; and

     This ensures the natural gas technology provides benefits through improved utilization during the summer months, when the distribution system has available capacity.

  4. Be fully operational prior to issuance of any rebate.

- **Rebate amounts are individually calculated based on the estimated operating schedule of the technology; not prescriptive.**

  Each application will be reviewed for three items: (1) addition of natural gas load, including evaluation of revenues generated by the equipment; (2) load factor of added natural gas load; and (3) installation and operation of the Energy Project, including expected date of operation and associated installation, operation and maintenance costs by New England Gas. Lastly, the Energy Project's *Technical Report* will be reviewed for engineering soundness. Applications for projects not meeting these criteria will be returned to the customer.

- **Three calculations will be performed for each project to determine the award amount**.

  New England Gas' DSM program is designed to provide the largest rebates to the projects with the most significant benefit to all of the firm customers. To achieve this objective, three calculations are completed for each eligible project. The resulting rebates are based on the lesser of:

  1. 75% of the net margin generated over the accepted lifetime of the technology under the appropriate rate;
  2. 75% of the difference in costs between the Base and Alternate Energy Projects; and
  3. the capital contribution required to lower the Base Energy Project's simple payback to 1.5 years, when compared to the Alternate Energy Project.

All of these represent varying costs required to achieve a given benefit for the firm customers. Therefore, every Energy Project will have three cost-to-benefit ratios. In order to perform these

three calculations, New England Gas must receive a completed *Technical Report*. An example of a typical *Technical Report* is included in Appendix A.

Finally, it is important to note that there is a relationship between the DSM program's rebate and the Contribution In Aid of Construction (CIAC) for a new service/main or an upgrade to an existing service/main. For the case of new customers or customers whose application requires an investment in a new main, service and/or meter, the DSM rebate may be reduced by the contribution toward that investment.

The information provided in this Program Overview and the remaining document exclusively address the portions of the DSM program intended for the business community. For information regarding the residential customer, contact our residential DSM contact in the Commercial Sales Group at 401-272-5040.

III. APPLICATION

This section explains the step-by-step procedure a customer follows when submitting a DSM Application. It also introduces and explains the various forms required to be executed between the customer and New England Gas. Lastly, it references the purpose and location of the *Technical Guideline & Standard Reporting Format*.

Procedure

1. Customer identifies a potential Energy Project. The customer is considering two differently fueled technologies to satisfy an application's requirements. One of the Energy Project's technologies must be fueled by natural gas.
2. Customer makes a preliminary determination of the Energy Project's eligibility as defined in this document and contacts our DSM Administrator to clarify any concerns prior to commencing with the application process.
3. Customer requests DSM Application forms from our DSM Administrator or uses the forms provided in the appendices of this document.
4. Customer either directly performs an engineering analysis and assembles a *Technical Report* or contracts with an appropriate company (i.e., engineer, contractor, etc.) to perform the engineering analysis and assembles a *Technical Report*.
5. Customer determines if the final engineering analysis results in an Energy Project meeting the eligibility requirements detailed in this document.
6. If the customer's Energy Project meets the eligibility criteria, then the customer completes a DSM Application form, attaches the *Technical Report* and submits the completed application package to New England Gas' DSM Administrator.
7. New England Gas receives the completed DSM Application package, reviews the application package for completeness, reviews the Energy Project for eligibility and enters the appropriate information into a DSM tracking system.
8. The Energy Project's *Technical Report* is reviewed for a variety of characteristics like accuracy, engineering soundness, etc.
9. Upon approval of the project and associated rebate, the Company will send a letter of Award and Acceptance to the appropriate customers.
10. Customer executes the letter of Award & Acceptance and returns one original to New England Gas, while keeping the second.
11. Customer installs the Energy Project and notifies New England Gas' DSM Administrator upon complete, continuous and commercial operation of the Energy Project.
12. An authorized New England Gas representative will visit the site and review the Energy Project for installation and operation compliance. This will be no later than two weeks after a customer contacts the DSM Administrator for a final inspection.

13. Upon a successful final inspection, New England Gas will distribute the customer's rebate no later than two weeks after the inspection.

Distribution

Prior to distributing a rebate to a customer, the Energy Project will be inspected by an authorized New England Gas representative for the following items...

1. free of items potentially affecting the Energy Project's correct operation;
2. waiver of lien between the customer and the installing contractor(s);
3. commercial operation; and
4. absence of outstanding issues on all of customer's accounts with New England Gas.

The first bullet item ensures the project is completely installed and operational. The second item prevents the project from being legally stopped upon commencing its operation. The third item verifies the project is operating as an integral, day-to-day part of the customer's operations and in accordance with the *Technical Report.* The last item resolves any outstanding financial matters between a given customer's natural gas accounts and New England Gas.

The term "commercial operation" refers to the commencement of the project's day-to-day operation that results in the anticipated natural gas usage. Projects not being utilized in the manner outlined in the customer's *Technical Report* will not receive the awarded rebate until such conditions preventing its anticipated utilization are resolved.

The verification of a project meeting the four criteria outlined above will be performed by an authorized New England Gas representative. The inspection will occur within two weeks of contacting the
Demand Side Management Administrator.

Distribution of the rebate will only be made to the original applicant. Rebates will be forwarded to the original applicant within two weeks of a successful inspection by an authorized New England Gas representative.

Forms

This section briefly explains the purpose of each form used in the DSM program. Since some of the forms are for special circumstances, not all customers or Energy Projects may be required to use every form during the course of receiving a rebate. The forms associated with the following explanations may be found in *Appendix B - Program Forms*.

DSM Application

The application form is referred to as the DSM Application. Its purpose is to organize and summarize the appropriate information on the customer and the customer's Energy Project. This form must be completed and submitted by all customers prior to New England Gas evaluating a customer's Energy Project for a rebate. A "completed" DSM Application form refers to one which is fully complete and is free of significant errors, New England Gas may, at its sole discretion, return an incomplete or error filled DSM Application to the customer. The DSM Application is inclusive of the *Technical Report*. Lastly, the applicant must be the Energy Project's owner.

Award & Acceptance (Firm Service Rates)

The Award & Acceptance form is a letter with the purpose of notifying the customer of New England Gas's commitment to providing a rebate and also to acknowledge the customer's acceptance of the rebate. This particular form is used for all instances where the customer's project is using a firm supply of natural gas. The form is distributed to the customer by New England Gas's DSM Administrator upon selecting its Energy Project. It contains various terms and conditions associated with the award and acceptance of a rebate both the customer and New England Gas must follow. The most notable is the commitment of operating the Energy Project as outlined in the *Technical Report.*

Award & Acceptance (Non-Firm Service Rates)

This form is similar to and serves the same purpose as the Award & Acceptance form for firm customers, but it is only used for Energy Projects being served by a non-firm service rate. These are serviced under a non-firm rate and the technology being proposed has the capability of switching from natural gas to an alternate fuel at any given time of the day, month or year. The basic difference between this form and the one for firm customers is additional terms and conditions related to preserving the commitment between the customer and New England Gas for utilizing natural gas as the sole fuel source, except at the discretion of New England Gas.

Energy Project Compliance & Completion

The Energy Project Compliance & Completion form is used to verify the Energy Project has been installed and is operating as the *Technical Report* detailed as well as verifying the Energy Project's completion. The significance of this form is it allows the DSM Administrator to authorize the forwarding of the rebate to the customer.

Award Termination

The Award Termination form is used to terminate a rebate commitment New England Gas has made to a customer or a customer's commitment to install or operate a Energy Project for any reason. An example of the latter occurrence may be a corporate decision to move the facility after New England Gas has already committed to providing a rebate or a change in customer priorities after a rebate commitment. An example of the former is a customer that is not able to install and operate the Energy Project in the agreed upon time frame.

Technical Guideline & Standard Reporting Format

In order to ensure the success of each Energy Project from both the customer's and New England Gas' perspectives and assist in determining the rebate amount, New England Gas requires the submission of a *Technical Report* with each DSM Application. The *Technical Report* will allow the DSM Administrator and Quality Control Manager to understand and evaluate the Energy Project from engineering and financial perspectives. The Quality Control management will be performed by an independent engineering company. Any questions related to an Energy Project's engineering soundness must be resolved prior to determining an award and rebate amount. Regardless of project size or complexity, all *Technical Reports* are required to be assembled in accordance with the *Technical Guideline & Standard Reporting Format* detailed in *Appendix A* of this document.

IV. QUESTIONS

Questions related to the C&I portions (i.e., NGV, Cogeneration and Customized C&I) of New England Gas' DSM program may be directed to the New England Gas Company's Demand Side Management Administrator at 401-272-5040.

V. GLOSSARY

This section summarizes and defines common terms used throughout this document.

DSM.....	Demand Side Management program.
NEGAS.....	The New England Gas Company.
CCF.....	One hundred cubic feet of natural gas at standard conditions of 60^{o}F and 14.7 psig.
PSIG.....	Pounds per square inch gauge.
LNG.....	Liquefied Natural Gas.
NG.....	Natural Gas.
NGV.....	Natural Gas Vehicle.
CNG.....	Compressed Natural Gas.
DF.....	Dual Fuel.
Off-Peak.....	The months of May, June, July, August, September & October.
On-Peak.....	The months of November, December, January, February, March & April.
C&I.....	Commercial and Industrial.
CIAC.....	Contribution In Aid of Construction

APPENDIX A

TECHNICAL GUIDELINE & TYPICAL REPORTING FORMAT

THE NEW ENGLAND GAS COMPANY

COMMERCIAL & INDUSTRIAL

DEMAND SIDE MANAGEMENT PROGRAM

Company Name
Street Address
City, State

Project Name:

PROCESS BOILER

Date

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1.0 ENERGY PROJECT SUMMARY

The Base Energy Project is a one-for-one replacement of an existing high pressure steam, No.4 oil fired boiler. It will utilize a dual fuel burner (i.e., No.4 oil and natural gas) boiler and will provide 75 pounds per square inch gage steam to the same manufacturing process application as the current boiler. The Company's manufacturing process does not require any modification due to the Base Energy Project. The new, 125 horsepower steam boiler will completely satisfy the manufacturing process' load.

The Base Energy Project will be installed in The Company's manufacturing facility located at Street Address in City, Rhode Island. Since this facility does not currently have a natural gas service, a new one is required to serve the boiler. It will consist of approximately 155 feet of 2 inch diameter plastic pipe connected to an existing main in front of Street Address.

This facility's existing, monthly natural gas usage will not be impacted, since there is not any monthly usage at this time. Based upon the New England Gas Company's current service schedules and the manufacturing processes' historic No.4 oil usage, it appears the most appropriate schedule for the new boiler is Commercial & Industrial, Medium, High Load Factor. Depending upon the magnitude of the rebate, the Base Energy Project is scheduled for completion in April, 1997.

2.0 CURRENT GAS USAGE

As previously mentioned, The Company's Street Address manufacturing facility currently does not have a natural gas service, therefore, there is not any monthly natural gas usage to report.

3.0 APPLICATION

The manufacturing process utilizing the boiler's steam is a curing and drying application. The Company manufactures various types of equipment such as…

- xxxxxxxxx
- xxxxxxxxx
- xxxxxxxxx
- xxxxxxxxx

Raw material is in the form of rolled lines. This material is typically purchased from companies like DuPont. Depending upon the specific product's thickness, strength and durability specifications, an appropriate number of rolled lines are twisted together to form a finished product. Certain products are coated with an epoxy like substance or are dyed, requiring heat to cure or dry prior to packaging, respectively. Curing and drying take place in vertical process ovens called towers. The coated or dyed lines are pulled into the bottom of a vertical oven by an electric motor, "climb" to the top of the tower, reverse direction (180^{o}) on a pulley and return to the bottom of the tower for winding and packaging.

Each tower has three sections where heat is "injected" to cure or dry the lines. Seventy-five pound per square inch (psig) steam from the No.4 oil process boiler is sent to finned tubes in each section. Fresh air is pulled into the bottom of an oven via a single fan. The air simply passes across each finned tube section and fills the oven with warm air. Steam condensate is returned to the boiler room, mixed with make-up water, treated and routed back to the boiler.

The oil boiler operates off differential steam pressure maintaining approximately 75 psig at all times. The No.4 oil is pumped from a 10,000 gallon underground storage tank to the boiler's burner via the necessary valves, fittings, filters and an electrically fueled oil heater. (The boiler room is located below grade in a basement.) The heater raises the temperature of the oil to about 130 ^{o}F just prior to entering the burner. Unused oil is returned to the tank through a steam-to-oil heat exchanger designed to keep the oil warm in the tank.

Based upon the foreseeable future, The Company does not anticipate any reduction in the process' load. In fact, the new boiler has been slightly over-sized in order to accomodate future growth.

4.0 LOAD

The Company does not possess any actual metering data of its high pressure steam load for the tower manufacturing process. However, the following sections illustrate our engineering estimate of the processes' monthly load reported in thousands of British Thermal Units, or kBtu. For the purposes of this Technical Report, standby, distribution and heat exchanger thermal losses, etc. have been omitted, since the Base Energy Project will not result in a modification of the manufacturing process. Therefore, the pertinant "load" is the amount of heat leaving the boiler, not the amount of steam directly utilized by the process. The existing boiler is an International Watertube Boiler built and installed in 1950 and has received tune-ups twice a year.

The equation used to calculate the heat leaving the boiler was derived by the author and is not specifically cited. It is presented in this manner to keep the load calculation concise.

$$Q_{Process} = F_{Oil} * E_{Oil} / C_{kBtu} * N_{Efficiency}$$

where,

$Q_{Process}$	= Heat leaving boiler, kBtu/ 1 month;
F_{Oil}	= Amount of No.4 oil used in one month, gallons/1 month;
E_{Oil}	= Energy content of No.4 oil, Btu/ 1 gallon;
C_{kBtu}	= Conversion factor, 100,000 Btu/ 1 kBtu; and
$N_{Efficiency}$	= Average, estimated boiler efficiency, no units.

8,209 = (8,088) * (145,000) / (100,000) * 0.70

The following table details the historic No. 4 oil usage and the corresponding estimated amount of heat leaving the boiler each month. The historic oil usage is taken from a copy of The Company's monthly consumption record located in *Appendix D - Detailed Application Load Calculations.*

"PROCESS" LOAD

MONTH & YEAR	HISTORIC NO. 4 OIL CONSUMPTION (GALLONS)	"PROCESS" LOAD (kBtu)
January, 1996	0	0
February, 1996	0	0
March, 1996	0	0
April, 1996	0	0
May, 1996	8,088	8,209
June, 1996	6,110	6,202
July, 1996	4,073	4,134
August, 1996	5,650	5,735
September, 1996	3,784	3,841
October, 1996	0	0
November, 1996	0	0
December, 1996	0	0
Totals	**27,705**	**28,121**

Notes:

1. The Company does not possess a recent burner or boiler efficiency test. The existing boiler's efficiency is assumed to be 70%.
2. All months showing zero (except October) are when the new boiler will be operating on oil due to the existing natural gas distribution system's limitations in City at this time.
3. kBtu refers to 100,000 Btu.

5.0 BASE PROJECT

The Base Energy Project for this Technical Report is defined as the process steam boiler with dual fuel capability. The two fuels are natural gas and No.4 oil.

5.1 SYSTEM DESCRIPTION

The Base Energy Project's natural gas technology is a common, high pressure steam boiler. It is a 125 horsepower Cleaver-Brooks, packaged fire-tube boiler with a Cleaver-Brooks dual fuel burner system. The model number is CB900-125-150, where 900 refers to No.4 oil/natural gas fuels; 125 refers to horsepower and 150 refers to design steam pressure (i.e., 150 psig). It is capable of operating on either natural gas or No.4 oil. This boiler will be controlled with common pressure controls monitoring steam pressure to determine whether or not fuel is needed to maintain 75 psig. Since this boiler is a one-for-one replacement, it will integrate with the existing steam distribution system and manufacturing process without modification.

No.4 oil will be delivered from two aboveground, double walled oil storage tanks. Both 2,500 gallon tanks will be located in the room adjacent to the boiler room. Natural gas will be delivered via an underground service from xxxxxx Street to the boiler room. The exhaust flue and electric power panels will be new, but placed in the same space they currently occupy.

A schematic diagram of the boiler house is located *Appendix A* of this *Technical Report*.

5.2 SCOPE OF WORK

Permitting

The only permits required for this installation are the town of xxxxxx's local building, plumbing/mechanical and electrical permits.

Engineering

Design engineering is not required for this project, since it is a simple one-for-one replacement. The only difference between the existing and new boiler is the size; with the new boiler being 25 horsepower larger.

Civil Installation

In order to remove the existing boiler and rig the new boiler into place, the existing masonary wall must be demolished. This wall is at the outside grade, while the boiler rests one grade below. An overhead door will be installed in lieu of replacing the wall.

Although the existing concrete foundation will be reused, a small extension at the burner end of the boiler will be formed and poured to bridge an existing drain.

The two new oil tanks will be located in the room next to the boiler. Each tank is 2,500 gallons and has a double containment system. As with the boiler room wall at outside grade, the corresponding wall for the oil tanks must also be demolished in order to rig the oil tanks into place. The room housing the oil tanks has been gutted, cleaned and prepared for the tanks.

Mechanical Installation

This portion of the installation consists of steam header, flue, condensate return and tank, city water, compressed air and oil delivery and pre-heat subsystem interconnections. The only new system is the natural gas piping system.

The existing steam header located directly above the boiler will be reused. The only connection required is to the gate valve. This steam line is 8 inches in diameter.

A new flue (included as part of the boiler package) will be installed. It will be located directly above the new boiler. The new flue is approximately 16 inches in diameter and 25 feet in height.

The existing condensate return system will be replaced. This system will be located in the oil storage room adjacent to the boiler room. It will consist of a new 270 gallon receiving tank, pump, vent and the associated fittings and valves. The city water will be from the existing city water connection point without any changes.

The existing air compressor will be used with only slight modification to the delivery piping to satisfy the new connection point on the Cleaver-Brooks boiler. The compressed air is used to atomize the No.4 oil at the burner.

The existing primary, steam pre-heat system will not be replaced due to the tanks being located inside the building as opposed to outside and underground. A new fuel oil delivery and storage system will be installed. Two 2,500 gallon, double containment, steel oil storage tanks will be rigged and installed in the room adjacent to the boiler room. The tanks will be interconnected through common manifolds on both the supply and return. Oil will flow through a single filter and be pumped (new, 3 HP pump) through 1 1/8" carbon steel, screwed pipe with the appropriate fittings to the electric pre-heater. After the pre-heater, oil is pumped through a duplex oil filter (re-used) and delivered to the burner's control valve. This is all 1 1/8" piping. Unused oil is returned to the oil storage tanks via 1 1/8" piping.

A new natural gas service will be installed by The New England Gas Company. It will consist of approximately 155' of 2" plastic piping and the associated valves, regulator and meter header. The meter header will be located just outside the boiler room at grade level. A 2" natural gas, carbon steel pipe will be installed from the meter, through the masonary wall (on the burner side of the boiler), overhead from the boiler and a vertical run down to the burner. A pressure regulating valve will reduce the pressure from about 25" of water column (W.C.) to 12" W.C. An approved natural gas fuel train will be installed adjacent to the boiler and will consist of two control valves, vents and an isolation valve, along with miscellaneous fittings.

Electrical Installation

The electrical installation for this project is minimal due to the packaging of the various equipment. The only major electrical work will consist of routing power to the burner panel on the boiler, condensate return pump and electric pre-heater for the oil.

Rigging

The boiler will be rigged off of a trailer and positioned at the edge of the boiler room at outside grade. The boiler will be rolled onto outside grade level timbers. The timbers will be systematically removed until the boiler is completely lowered into the room and positioned. Final leveling to Cleaver-Brooks specifications will be performed by a millwright.

Start-Up & Testing

This will be performed by the local Cleaver-Brooks technician. The technician will be accompanied as needed by the mechanical and electrical installation contractors.

5.3 CAPITAL COST

Description of Task	Number of Units	Base Energy Project ($)
Permitting		
Local Building	1	$0
Engineering	0	$0
Major Equipment		
Steam Boiler (125 HP)	1	$81,000
Exhaust Flue	1	$0
Cond. Return Package	1	$0
Oil Storage Tank	2	$23,000
Civil Installation		
Masonary	1 Lot	$3,000
Overhead Door	1	$2,000
Oil Tank Removal	Not Eligible	$0
Asbestos Removal	Not Eligible	$0
Mechanical Installation	1 Lot	$4,481
Electrical Installation	1 Lot	$3,000
Utility Installation (NG Service)	1 Lot	$5,763
Rigging	1 Lot	$2,000
Project Management	0	$0
Start-Up & Testing	0	$0
TOTALS	**N/A**	**$124,244**

Notes:

1. Permitting - Included in Atlas' lump-sum quotation.
2. Engineering - Not required due the simplicity of the project.
3. Project Management - Performed by xxxxxxx by separately hiring contractors.
4. Start-Up & Testing - Included in the costs for Boiler and Mechanical and Electrical Installations.

5.4 ENERGY USAGE

The methodology used to calculate the quantity of natural gas the boiler will consume is derived by the author.

$$NG_{Usage} = Q_{Process} * C_{kBtu} / N_{Efficiency} / LHV$$

where,

NG_{Usage} = Natural gas used by the boiler, CCF;
$Q_{Process}$ = Heat leaving the boiler, kBtu/ 1 month;
C_{kBtu} = Conversion factor, 100,000 Btu/ 1 kBtu;
$N_{Efficiency}$ = Reported new boiler's efficiency at 75% firing, no units; and
LHV = Lower Heating Value of natural gas, 92,520 Btu/ 1 CCF.

10,954 = (8,209) * (100,000) / (0.81) / (92,520)

CURRENT & BASE ENERGY PROJECT NATURAL GAS USAGE

MONTH & YEAR	PROCESS LOAD (kBtu)	CURRENT NG USAGE (CCF)	BASE NG USAGE (CCF)
January, 1996	0	0	0
February, 1996	0	0	0
March, 1996	0	0	0
April, 1996	0	0	0
May, 1996	8,209	0	10,954
June, 1996	6,202	0	8,276
July, 1996	4,134	0	5,516
August, 1996	5,735	0	7,653
September, 1996	3,841	0	5,125
October, 1996	0	0	0
November, 1996	0	0	0
December, 1996	0	0	0
TOTALS	**28,121**	**0**	**37,524**

Notes:

1. Usage is not shown for January-March, November and December because it is not relevant to this *Technical Report.* The boiler is only approved to operate on natural gas from April-October. April's usage is not shown as an economic consideration to avoid being "bumped" into the Large, High Load Factor rate and a monthly demand charge on the natural gas, while October's usage is not shown due to no oil drops.

5.5 OPERATIONS & MAINTENANCE COSTS

Cost of Fuels

There are two fuels consumed by the boiler for the aforementioned months of operation on natural gas - natural gas and electricity. Natural gas is used as the main fuel in the boiler, while electricity is used to operate the burner's blower motor.

Natural gas will be purchased from the New England Gas Company under its Commercial & Industrial, Medium, High Load Factor service schedule. Although this is a firm service schedule, it has been determined this boiler must be curtailed along with the non-firm customers located in the City area due to inadequate capacity during the New England Gas Company's on-peak season. Therefore, this boiler will operate on natural gas from May to October each year and adhere to the non-firm curtailment procedures as The Company's Lower Mill facility's non-firm account currently follows. Under this operating scenario, The Company will incur a customer charge for each month (12) and a commodity charge will be as the service schedule indicates. The monthly cost of natural gas is computed as follows.

$$NG_{Cost} = CC + (CCF_1 * CCF_{1\$}) + (CCF_2 * CCF_{2\$}) + (NG_{Usage} * GCC)$$

where,

NG_{Cost}	= Cost of natural gas, $/month;
CC	= Customer charge, $/month;
CCF_1	= First step volume thru meter, CCF/month;
CCF_2	= All other step volume thru meter, CCF/month;
$CCF_{1\$}$	= First step volume price, $/CCF;
$CCF_{2\$}$	= All other volume thru meter price, $/CCF;
NG_{Usage}	= Total volume thru meter, CCF/month; and
GCC	= Gas Charge Clause, $/CCF.

6,313.90 = (28) + (675 * 0.6504) + (10,279 * 0.4679) + (10,954 * 0.0947)

COST OF NATURAL GAS

MONTH & YEAR	NATURAL GAS USAGE (CCF)	NATURAL GAS COST ($)
January, 1996	0	$28.00
February, 1996	0	$28.00
March, 1996	0	$28.00
April, 1996	0	$28.00
May, 1996	10,954	$6,313.90
June, 1996	8,276	$4,807.27
July, 1996	5,516	$3,554.49
August, 1996	7,653	$4,456.77
September, 1996	5,125	$3,034.52
October, 1996	0	$28.00
November, 1996	0	$28.00
December, 1996	0	$28.00
TOTALS	**37,524**	**$22,362.95**

1. Electricity for the burner will be purchased from the Narragansett Electric Company under the facility's existing G-30 service schedule. When the burner is operating on natural gas, the Cleaver-Brooks cut-sheet indicates it will consume less electricity than on oil. Therefore, no calculations of electricity cost is provided below for natural gas. (The estimate for oil is calculated in the Alternate Energy Project section of this *Technical Report*.)

Labor & Materials

Only the incremental labor and material costs are illustrated in this section. Since The Company does not have to add labor to operate the new boiler, then there is not any associated operating labor cost. Also, since the amount of boiler feedwater chemicals is independent of the fuel used, there is not any incremental operating material cost. Lastly, according to a local Cleaver-Brooks representative, the annual maintenance cost for a dual fuel (No.4 oil and natural gas) is the same as for a No.4 oil only boiler (both are about $900). Since there is not any incremental cost, the maintenance not shown below.

SUMMARY OF ANNUAL O&M COSTS FOR BASE PROJECT

O&M ITEM DESCRIPTION	ANNUAL COST
Fuel	
Natural Gas	$22,362.95
Electricity	$0
Operations	$0
Maintenance	$0
TOTALS	**$22,362.95**

6.0 ALTERNATE PROJECT

The Alternate Energy Project for this *Technical Report* identical to the Base Energy Project, without the natural gas service, meter header and piping in the boiler room.

6.1 SYSTEM DESCRIPTION

The system's description is identical to the Base energy Project's, without the natural gas service, meter header and piping in the boiler room.

6.2 SCOPE OF WORK

Mechanical Installation

This area of work will be the only one with a significant difference between the Base and Alternate Energy Projects. The natural gas underground service and piping from the outlet side of the meter header to the burner's fuel train will not be performed. This is inclusive of the associated venting and minor controls work.

6.3 CAPITAL COST

Description of Task	Number of Units	Base Energy Project ($)
Permitting		
Local Building	1	$0
Engineering	0	$0
Major Equipment		
Steam Boiler (125 HP)	1	$81,000
Exhaust Flue	1	$0
Cond. Return Package	1	$0
Oil Storage Tank	2	$23,000
Civil Installation		
Masonary	1 Lot	$3,000
Overhead Door	1	$2,000
Oil Tank Removal	Not Eligible	$0
Asbestos Removal	Not Eligible	$0
Mechanical Installation	1 Lot	$3,000
Electrical Installation	1 Lot	$3,000
Rigging	1 Lot	$2,000
Project Management	0	$0
Start-Up & Testing	0	$0
TOTALS	**N/A**	**$117,000**

Notes:

1. Engineering - Not required due the simplicity of the project.
2. Project Management - Performed by Equipment by separately hiring contractors.
3. Start-Up & Testing - Included in the costs for Boiler and Mechanical and Electrical Installations.

6.4 ENERGY USAGE

The energy used by the Alternate Energy Project consists of No.4 oil and electricity. The No.4 oil is based upon the historic consumption taken from *Appendix D - Detailed Application Load Calculations*.

The boiler will use about 7.6 kilowatts (i.e., 5 kilowatts for oil heater, 3 hp for oil storage tank pump and 0.5 hp for oil pump shown on Cut Sheet in *Appendix B - Manufacturer's Performance Data Sheets* with 0.746 kW/hp as the conversion.) more electricity when operating on No.4 oil for this particular model boiler. Since the burner's electric energy usage is relatively small, the average cost of a kilowatt-hour from The Company's corresponding monthly bills has been used to determine the average price of electricity. The customer charge has been omitted, because it does not represent an incremental cost to operate the boiler. With these items in mind, the monthly usage of electicity may be calculated as follows.

$$E_{Usage} = Oil_{Usage} / Oil_{Hourly} * E_{Burner}$$

where,

E_{Usage} = Electricity used by burner, kWh/month;
Oil_{Usage} = Oil used by the boiler, Gallons/month;
Oil_{Hourly} = Ave. rated oil demand (Light & Heavy) on burner, CCF/hour;
E_{Burner} = Rated electricity demand on burner, kW; and

1,696 = (8,088) / (36.25) * (7.6)

ELECTRICITY USAGE

MONTH & YEAR	HISTORIC OIL USAGE (GALLONS)	BURNER'S ELECTRICITY USAGE (kWh)
January, 1996	0	0
February, 1996	0	0
March, 1996	0	0
April, 1996	0	0
May, 1996	8,088	1,696
June, 1996	6,110	1,281
July, 1996	4,073	854
August, 1996	5,650	1,185
September, 1996	3,784	793
October, 1996	0	0
November, 1996	0	0
December, 1996	0	0
TOTALS	**27,705**	**5,809**

6.5 OPERATIONS & MAINTENANCE COSTS

Cost of Fuels

There are two fuels consumed by the boiler for the aforementioned months of operation on No.4 oil - No.4 oil and electricity. No.4 oil is used as the main fuel in the boiler, while electricity is used to operate the burner's blower motor.

The Company currently purchases its No.4 oil from a variety of suppliers throughout the year. The cost of No.4 oil at the Upper Mill facility is as follows.

$$Oil_{Cost} = Oil_{Usage} * Oil_{Price}$$

where,

Oil_{Cost} = Cost of No.4 oil, $/month;
Oil_{Usage} = Total gallons used, Gallons/month; and
Oil_{Price} = Price from supplier, $/Gallon.

4,022.36 = (8,088) * (0.6086)

The Company currently purchases its electricity from Narragansett Electric Company under the G-30 service rate. The cost of electricity (incremental for oil firing of the burner) for the burner at the Upper Mill facility is as follows.

$$E_{Cost} = E_{Usage} * E_{Price}$$

where,

E_{Cost} = Total cost of electricity, $/month;
E_{Usage} = Electricity used by burner, kWh/month; and
E_{Price} = Ave. electricity price, $/kWh.

59.48 = (1,696) * (0.05868)

COST OF NO.4 OIL AND ELECTRICITY

MONTH & YEAR	OIL USAGE (GAL.)	OIL PRICE ($/GAL.)	OIL COST ($)	ELEC. USAGE (kWh)	ELEC. PRICE ($/kWh)	ELEC. COST ($)
Jan, 1996	0	0	0	0	0	0
Feb, 1996	0	0	0	0	0	0
Mar, 1996	0	0	0	0	0	0
Apr, 1996	0	0	0	0	0	0
May, 1996	8,088	$0.6086	$4,922.36	1,696	$0.05868	$99.52
Jun, 1996	6,110	$0.5455	$3,333.01	1,281	$0.05868	$75.17
Jul, 1996	4,073	$0.5663	$2,306.54	854	$0.06063	$51.78
Aug, 1996	5,650	$0.5897	$3,331.81	1,185	$0.06187	$73.32
Sep, 1996	3,784	$0.6312	$2,388.46	793	$0.06142	$48.71
Oct, 1996	0	0	0	0	0	0
Nov, 1996	0	0	0	0	0	0
Dec, 1996	0	0	0	0	0	0
TOTAL	**27,705**	**$ 0.59**	**$16,282.18**	**5,809**	**$ 0.06**	**$ 348.50**

Labor & Materials

Same explanation as in the Base Energy Project.

SUMMARY OF ANNUAL O&M COSTS FOR ALTERNATE PROJECT

O&M ITEM DESCRIPTION	ANNUAL COST
Fuel	
No.4 Oil	$16,282.18
Electricity	$348.50
Operations	$0
Maintenance	$0
TOTALS	**$16,630.68**

7.0 SUMMARY TABLE

Energy Project	Capital Cost	O&M Costs	Simple Payback (Yrs.)	Load Factor (%)	Annual Gas Usage (CCF)	Equip. Life (Years)
Current	N/A	N/A	N/A	N/A	N/A	N/A
Base	$124,244	$22,363	N/A	N/A	37,524	25
Alternate	$117,000	$16,631	(1.26)	100%	0	25
Differences	$7,244	($5,732)	N/A	N/A	37,524	0

Notes:

1. Load factor is 100%, since natural gas is only used between May and October.
2. ASHRAE Handbook of HVAC Systems & Applications, 1987; Page 49.7. See *Appendix H.*

8.0 APPENDIX A - Schematic Diagram

9.0 APPENDIX B - Manufacturer's Performance Data Sheets

10.0 APPENDIX C - Detailed Capital Cost Estimate

11.0 APPENDIX D - Detailed Application Load Calculations

12.0 APPENDIX E - Detailed Energy Usage Calculations

13.0 APPENDIX F - Average Price of Electricity Calculation

14.0 APPENDIX G – New England Gas Load Approval Letter & Quotation

15.0 APPENDIX H - ASHRAE's Equipment Service Life

APPENDIX B

DSM PROGRAM FORMS

THE NEW ENGLAND GAS COMPANY

COMMERCIAL & INDUSTRIAL DEMAND SIDE MANAGEMENT PROGRAM

DSM APPLICATION

APPLICANT'S MAILING INFORMATION	APPLICANT'S CONTACT INFORMATION
Company Name:	Contact Name:
P.O. Box:	Department:
Street Address:	Title:
City/Town	Telephone #:
State & Zip Code:	Fax #:

ENERGY PROJECT INFORMATION	NEW ENGLAND GAS USE ONLY
Base Energy Project Name:	Application Receipt Date:
Company Name	Technical Report Receipt Date:
Building Name:	Quality Control Returned:
Street Address:	Incremental NG:
City/Town:	Service Rate:
Application Date:	Load Factor:
Technical Report Date:	Rebate:

THE NEW ENGLAND GAS COMPANY

COMMERCIAL & INDUSTRIAL DEMAND SIDE MANAGEMENT PROGRAM

LETTER OF AWARD & ACCEPTANCE

FIRM SERVICE RATES

This *Letter of Award & Acceptance* confirms The New England Gas Company's commitment to provide --------- with a $-------- rebate corresponding to---------- installing a gas fired process boiler.

The rebate is a result of --------*DSM Application*, dated ----------, submitted to The New England Gas Company's Commercial & Industrial Demand Side Management Program. The rebate is solely intended for the installation of a gas fired boiler for process and may not be used towards any other endeavor other than the Conversion Energy Project cited in the aforementioned *DSM Application* and corresponding *Technical Report.*

This commitment is based upon ---------Energy Project consuming an incremental amount of natural gas as indicated in the attached table, *NATURAL GAS USAGE - Table No.1* under ---------- service rate as indicated in the *DSM Application* and *Technical Report* and The New England Gas Company has executed a copy of the *Letter of Energy Project Compliance & Completion* prior----------; Energy Projects not meeting these criteria will result in a termination of the DSM rebate.

CUSTOMER agrees to allow The New England Gas Company periodic access to its Energy Project's invoices, records, utility bills, etc. to confirm the actual versus estimated performance as documented in the *DSM Application* and *Technical Report.* The periodic access will not exceed the first two years of the Energy Project's commercial operation. Upon The New England Gas Company identifying the Energy Project under performing, ---------- is obligated to return the full rebate to The New England Gas Company within four weeks from the date of a *Letter of Termination* from The New England Gas Company.

By signing this *Letter of Award & Acceptance,* The New England Gas Company acknowledges the award and acknowledges ---------- intent to proceed with the Energy Project. Moreover, ---------- further commits to The New England Gas Company that -------- will install and operate the Conversion to Natural Gas Energy Project in accordance with the *DSM Application* and the *Technical Report,* both dated ----------, as well as the following correspondence...

DATE	AUTHOR	SUBJECT
5/12/99	----------	Gas Fired Process Boiler

This *Letter of Award & Acceptance* and corresponding rebate may not be assigned to another party without the prior written approval of the new England Gas Company.

CUSTOMER warrants to The New England Gas Company that the undersigned is a representative of CUSTOMER and is authorized to execute this *Letter of Award & Acceptance*.

THE NEW ENGLAND GAS COMPANY	**CUSTOMER**
Name (Authorized Signature)	Name (Authorized Signature)
Name (Print)	Name (Print)
Title (Print)	Title (Print)
Date	Date

NATURAL GAS USAGE

Table No.1

MONTH & YEAR	HISTORICAL USAGE (CCF)	ANTICIPATED USAGE (CCF)	INCREMENTAL USAGE (CCF)
January,			
February,			
March,			
April,			
May,			
June,			
July,			
August,			
September,			
October,			
November,			
December,			
Totals			

NATURAL GAS SERVICE RATE

Check the natural gas service rate the Energy Project's incremental consumption of natural gas will occur under.

- ☐ Small, High Load Factor
- ☐ Small, Low Load Factor
- ☐ Medium, High Load Factor
- ☐ Medium, Low Load Factor
- ☐ Large, High Load Factor
- ☐ Large, Low Load Factor
- ☐ Extra-Large, High Load Factor
- ☐ Extra-Large, Low Load Factor
- ☐ CNG Vehicle – Firm
- ☐ CNG Vehicle – Interruptible
- ☐ Gas Lamps
- ☐ Non-Firm Sales - No.2 Oil
- ☐ Non-Firm Sales - No.4 Oil
- ☐ Non-Firm Sales - No.6 Oil
- ☐ Non-Firm Sales – Propane
- ☐ Non-Firm Transportation
- ☐ Flexible Firm
- ☐ Firm Transportation
- ☐ Standby
- ☐ Balancing

THE NEW ENGLAND GAS COMPANY

COMMERCIAL & INDUSTRIAL DEMAND SIDE MANAGEMENT PROGRAM

LETTER OF ENERGY PROJECT COMPLIANCE & COMPETITION

Customer warrants to The New England Gas Company that the "Duel Fuel Conversion of Process Boilers and Glass Furnaces" Energy Project is operating and is being maintained as outlined in the GE Lighting *DSM Application*, dated May 8th, 1997 and *Technical Report* of the same date.

Customer further warrants to The New England Gas Company there are not any punchlist items, executed or pending liens, life safety or other applicable Federal, State or local code violations, or any other potential or pending encumbrances that might jeopardize the Energy Project's commercial operation in Customer's aforementioned *DSM Application* and *Technical Report*.

Customer agrees it has disclosed and provided sufficient information to the New England Gas Company and its authorized representative, prior to and during the site inspection, for the representative to determine any reason the Energy Project is not in full compliance to receive the rebate.

The New England Gas Company acknowledges its review and inspection of "Sample" Energy Project on this 4th day of November, 1997. Based upon Customer agreeing to the aforementioned terms and conditions and The New England Gas Company's authorized representative's review and inspection of the Energy Project, The New England Gas Company hereby acknowledges the completion, commercial operation and compliance of the Energy Project.
Customer warrants to the New England Gas Company that the undersigned is a representative of Customer and is authorized to execute this *Letter of Energy Project Compliance & Completion*.

THE NEW ENGLAND GAS COMPANY	**CUSTOMER**
Name (Authorized Signature)	**Name (Authorized Signature)**
Name (Print)	**Name (Print)**
Title (Print)	**Title (Print)**
Date	**Date**

APPENDIX C

EQUIPMENT MANUFACTURERS

Massachusetts, New Hampshire, New York City, Long Island & Rhode Island

Energy Efficiency Engineering Study Application
for Business and Multifamily Buildings

50% of the cost of an engineering study is available for approved projects up to $10,000 for gas heating business customers.

nationalgrid

The power of action.℠

Save on energy, save on operating costs, save the environment

Follow these steps to participate:

1) The engineering study must be completed by either a certified energy manager (CEM) or a professional engineer (PE).
2) A complete application must be submitted for approval. All sections must be completed or included in an attachment.
3) The study results need to provide the following:
   - Engineer contact information
   - Executive summary including recommended efficiency measures and interactive gas and electric savings
   - Planned facility description and usage
   - Study process and methodology with detailed calculations and assumptions
   - Proved base case assumptions and proposed systems for all recommended energy conservation measures (ECMs)
   - Individual savings associated with each upgrade
4) Applications must be received by December 31, 2009, for consideration under the current program year.
5) 50% of the cost of an engineering study is available for approved projects up to $10,000 for gas heating business customers.

Examples of acceptable format of study results

Example 1: Table summary of recommended measures with interactive gas and electric savings

ECM No.	Measure Name	Savings		Total cost reduction	Incremental Cost	Simple payback
		Electric values kWh	Natural gas values therms			
Base Case	**Annual Energy Usage**	**703,241**	**16,038**	**$109,711**		
ECM #1	Improved wall insulation	-4,131	1,172	$1,166	$13,161	11.3
ECM #2	Improved window assemblies	5,330	-178	$403	$1,227	3.0
ECM #3	Demand Control Ventilation	18,205	591	$3,091	$7,170	2.3
ECM #4	Heat recovery off process load	-8,341	7,543	$9,757	$37,500	3.8
Interactive Subtotal for all measures		11,063	9,128	$14,417	$59,058	4.1
Proposed Case Interactive Energy Use		692,178	6,910	$95,294		

Example 2: Detail breakout of ECM #3

Base Case: Fixed ventilation based on estimated occupancy levels

Proposed Case: The installation of Demand Control Ventilation (DCV) will vary the amount of air delivered based on CO_2 levels in the space. Energy savings arise from the decrease in the amount of air handled by the HVAC units and fan boxes. By installing DCV, total air flow to the space can be reduced from 5,390 cfm to 4,353 cfm, yielding electrical savings of $3,091/year and natural gas savings of 591 therms/year. Payback for this measure is 2.3 years. The installation of this measure involves installing CO_2 sensors that are tied into the controls for the HVAC units and fan boxes.

Energy Efficiency Engineering Study Application

Customer/Facility Name **Account #**

Address **City** **State** **Zip**

Contact Name **Phone** **Email Address**

☐ **New Construction** **National Grid Representative** _____

☐ **Base Case or** ☐ **Proposed Case**

Project Description:

Project Scope: Identify gas-saving measure(s) that will be evaluated. Attach supporting documents.

Engineering Firm **Estimated Study Cost**

Address **City** **State** **Zip**

Contact Name **Phone** **Ext**

Study Start Date **Study Completion Date**

Please Pay Rebate To: Tax ID Number must be provided for payment.

Payee Name **Payee Tax ID #**

Address

City **State** **Zip**

Customer Signature **Customer Name (Please Print)** **Date**

Where did you hear about this program?

☐ SALES REP/ACCOUNT EXECUTIVE ☐ HEATING CONTRACTOR ☐ ENERGY AUDITOR ☐ EQUIPMENT SUPPLIER
☐ TRADE SHOW ☐ PRINT ADVERTISING ☐ INTERNET ☐ RADIO/TV ☐ OTHER

Please send this completed application along with scope of work or relevant sections of RFP requesting engineering services to:

National Grid Efficiency
1341 Elmwood Avenue
Cranston, RI 02910
1-800-843-3636
save@us.ngrid.com

nationalgrid
The power of action.

National Grid Energy Efficiency Engineering Co-funding Application Terms & Conditions

1. **Funding for Engineering Studies -** Subject to these Terms & Conditions, National Grid ("the Company"), through its contractual vendor, will pay rebates to eligible National Grid customers when approved projects are completed. Funding for Engineering Studies cannot be provided to firms who have a vested interest in deploying energy efficiency technologies, measures, or practices.

2. **Changes in the Engineering Grant Program -** National Grid reserves the right to close or alter the Program at any time. Check www.thinksmartthinkgreen.com frequently for program updates or installation extensions

3. **Customer Eligibility -** National Grid customers are eligible if they are firm tariff gas customers on a qualifying commercial rate code and they are directly responsible for the payment of the National Grid energy bills for the facility in which they do business. Completed applications must be received by 12/31/2009.

4. **Pre-Approval Process -** Funding for Engineering Studies must be approved, in writing, by National Grid and/or National Grid's representative in advance. Customers wishing to participate must submit a completed Energy Efficiency Application Form along with a scope of work to the Program. Customers will be notified in writing via a commitment letter of the approved Engineering Study and the approved rebate amounts.

5. **Post-Study Verification -** Grants for Engineering Studies completed will be paid at the sole discretion of the Company. National Grid requires two copies of the final report including supporting savings analysis. If the Company determines that the measure recommendations were not consistent with Program guidelines and applicable state and local code requirements, it may require that the Engineering Study be modified before making any grant payments. The cost of such modifications is the responsibility of the Customer.

6. **Energy Efficiency Improvements -** (a) The Program will only pay rebates for the pre-approved studies specified on the front of the Application. There will be no rebate payments for substitute measures unless the substitute is approved by the Program in writing and in advance of installation. (b) All installations must be installed in conformance with state and local code requirements and by properly licensed contractors.

7. **Grant Amounts -** The Company will provide grants for approved Engineering Studies equal to as much as 50% of the cost of the Engineering Study up to a maximum grant of $10,000.

8. **Indemnification -** Customer shall defend, indemnify and hold harmless the Company and its officers, directors, employees, agents, servants and assigns from and against any and all losses, claims, demands and/or liability for damage to property, injury or death of any person, or any other liability incurred by the Company, including all expenses, legal or otherwise, arising out of or related to the equipment or installation, except to the extent attributable to the negligence of Company. In no event shall Company's liability to Customer exceed the incentive amounts.

9. **Proof-of-Cost of Engineering Studies -** The Customer must submit copies of all invoices itemizing all the costs of the Engineering Study. In addition, the Company may request any other reasonable documentation or verification of the date of completion or the cost to the Customer of the Engineering Study. The documentation shall be provided with the submission of this application.

10. **Payment -** The Company intends to make rebate payments to eligible customers within 45 days of satisfactory work verification.

11. **No Warranties -** (a) The Company does not endorse, guarantee or warrant any particular contractor, vendor, manufacturer or product. (b) The Company does not make any representation of any kind regarding the results to be achieved by the recommended measures or the adequacy or safety of such measures.

12. **Limited Scope Review -** The scope of review by the Company and of the measure recommendation is limited solely to determining whether grants are payable. It does not include any kind of safety or code review, and should not be relied upon as one.

13. **Payments Assignable to a Third Party -** (a) The Customer may request that the Program grant be paid directly to a third party by so indicating on the front of this application. (b) If no payment choice is made, the Company will send the payment to the Customer directly at the address indicated in this Application.

14. **No Tax Liability to the Company -** The Customer shall be responsible for any tax liability which may be imposed as a result of receipt of the rebate by the Customer.

15. **Contractor Insurance -** The Company is not responsible for any damage that may be caused as a result of an installation of any recommended measure. It is the responsibility of the customer to select Contractors who carry appropriate insurance coverage.

National Grid is one of the largest investor-owned energy companies in the world. In the US, we serve nearly 5 million electric and 3.4 million gas customers in Massachusetts, New Hampshire, New York and Rhode Island. Save energy and money with our award-winning efficiency programs. **Visit www.thinksmartthinkgreen.com**.

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RAINFOREST ALLIANCE CERTIFIED

Division Data Request 3-8

Request:

Please provide the workpapers, spreadsheets, and electronic files relied upon to determine how and when the gas costs in the updated billing of service to non-firm customers used in the determination of duel fuel customer gas costs is reconciled with the actual costs to serve gas costs for non-firm customers incurred during the reconciliation period.

Response:

The rates charged for gas costs when billing is updated are the rates applicable for the period when the gas was delivered as shown in the Attachment JNN-7s. For example, Customer #6 on page 4 shows an adjustment made in January for prior months and demonstrates that the unit gas cost applied to make the adjustment was that applicable to the month in which the gas was delivered. The rates for the various months have been provided in response to Division Data Requests DIV 2-9a and DIV 3-4. As bills are updated to reflect the discovery of billing issues, the change in invoiced gas costs from the prior invoice is booked as an adjustment and becomes part of total gas costs in the month in which the adjustment is made. The gas costs shown in Attachment JNN-7s are the invoiced gas costs including any updates.

Prepared by or under the supervision of: Gary Beland and John F. Nestor, III

Division Data Request 3-9

Request:

Please provide documentation of the determination for the dollar amount and number of therms for each updated billing adjustment of greater than $100 referenced in the comments column of figure JFN-7S pg 4-18, and provide the Company's rational for each adjustment for an amount greater than $100.

Response:

After discussion with the Division, it is the Company's understanding that in this request the Division is seeking to update the information on adjustments of $1,000 and that this information was provided in the Company's Response to Data Request DIV 2-8.

Prepared by or under the supervision of: Jeff Martin and Tom Teehan (Counsel)