



**Synapse**  
Energy Economics, Inc.

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## **Independent Audit of the ReGen Renewable Power Product from CSG**

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**Conservation Services Group**

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## **Disclaimer**

Synapse Energy Economics, Inc. makes no claim as to the environmental or financial desirability of the ReGen product, which is marketed and sold by the Conservation Services Group (*CSG*). The purpose of this independent audit is to verify the reliability of the information used by *CSG* in the marketing and sale of the ReGen product.

# 1. Summary & Introduction

## 1.1 Summary

Synapse Energy Economics, Inc. (Synapse) is a research and consulting firm that specializes in energy, economic and environmental topics. Our primary emphasis is on electric industry planning, regulation and restructuring. We work for a wide range of clients including state and federal government agencies, consumer advocates and environmental organizations. Our projects cover the following topics: electric system modeling, market power analyses, stranded costs, electricity market prices, generating asset valuation, electricity consumer protection policies, renewable resources, energy efficiency, and environmental regulations.

At the request of Conservation Service Group (*CSG*), Synapse has performed this independent audit of *CSG*'s ReGen product, for the time frame of January 1, 2001 through December 31, 2001. The purpose of this audit is to verify that *CSG* purchased a sufficient amount of energy from the designated renewable sources to meet its obligations to its ReGen customers. In addition, Synapse was asked to verify the claimed air emissions benefits of the generation from the designated renewable resources and to evaluate the potential impact of recent Massachusetts' regulations establishing a renewable portfolio standard (RPS) for retail electric suppliers.

Upon inspection of the information provided by *CSG* and the information relied upon from outside sources, we find that *CSG* purchased a sufficient amount of power from the designated renewable resources to meet its obligations to its ReGen customers. In fact, the amount of electricity purchased by *CSG* from the designated renewable sources was substantially greater than the amount needed to meet the obligations to ReGen customers. Further, the air emissions information presented is reasonable for the time frame of the audit. Going forward the air emissions information will need to be updated to reflect the most up to date regional air emissions statistics. As to the Massachusetts RPS regulations, the generation resources utilized by *CSG* to provide electricity to its customers are eligible to qualify as "new renewable resources" under the terms of the regulations.

## 1.2 Introduction

### Product Description

The ReGen product is an "add on" product to the electricity that a resident or business buys. By purchasing a block of the ReGen product a customer receives a commitment from *CSG* to purchase 2000 kWh of electricity per year from a mix of solar and landfill gas suppliers on their behalf. *CSG* purchases electricity from solar and landfill gas providers for the sole purpose of satisfying ReGen obligations.

To date, *CSG* has relied on its Sun Power Electric division to supply solar power. Landfill gas power has come from Highland Power Corporation and Union Power Corporation (Highland/Union).

Sun Power, a division of Conservation Services Group, is an all-photovoltaic (PV) power supplier, which concentrates its PV installations on large rooftop sites such as BJ's Wholesale Clubs in North Dartmouth, MA and Middletown, RI. Energy produced from Sun Power accounts for approximately 1.0% of the total energy purchased by *CSG*; and it provides 3-10% of *CSG*'s obligation, on a monthly basis, for its ReGen customers.

Highland/Union is a landfill gas plant located in Attleboro, Massachusetts. The facility consists of two engine generators fueled solely by landfill gas, each driving an 850kW (gross) generator. Energy purchased from Highland/Union by *CSG* provides approximately 99% of the total energy purchased and fills out *CSG*'s obligation, on a monthly basis, for its ReGen customers.

The electricity flowing into a customer's home is not changed as a result of the purchase of ReGen but the "pool" of power being produced for society at large will include more from ReGen power sources. A 2000 kWh/year block of ReGen acts to displace 2000 kWh/year from conventional, existing electricity sources. These sources are traditionally fueled by nuclear, coal, oil, or natural gas.

*CSG* markets the ReGen product on the grounds of the air emissions benefits obtained by displacing conventional electricity sources. These air emissions benefits include a reduction in SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub> emissions.

## Information

For the purposes of this audit Synapse relied on the following information provided by *CSG*:

- Contracts drawn between *CSG* for the purchase of electricity from Highland/Union's landfill gas facility located in Attleboro, Massachusetts and the generation information from *CSG*'s PV owned power plants in North Dartmouth, MA and Attleboro, MA.
- Invoices for the purchase of electricity from *CSG* and Highland/Union.
- Records of sale detailing the timing and amount of electricity purchased by *CSG* from Highland/Union.
- Marketing materials and product descriptions for ReGen.
- Emissions information on sources of energy for the ReGen product.
- Customer activity records for the time period of the audit.

Synapse also relied on the following information provided by outside sources:

- 1997 Marginal Emission Rate Analysis for the NEPOOL Environmental Planning Committee, produced by ISO New England, February, 1999. (1997 NEPOOL MEA Report)

- 1998 Marginal Emission Rate Analysis for the NEPOOL Environmental Planning Committee, produced by ISO New England, February, 2000. (1998 NEPOOL MEA Report)
- 2000 Marginal Emission Rate Analysis for the NEPOOL Environmental Planning Committee, produced by ISO New England, June, 2002. (2000 NEPOOL MEA Report)

## 2. Audit

### 2.1 Methodology

In conducting the audit we took the following steps:

- 1) Perform a “power purchase audit” to verify, using purchase invoices from *CSG* and billing invoices from Sun Power and Highland/Union, that *CSG* did indeed purchase the electricity in the amounts and from the sources that they claimed to.
- 2) Perform a “ReGen sales audit” to verify, using customer records, that the electricity purchased from the designated power sources was enough to meet the demand of ReGen customers.
- 3) Perform an “air emissions audit” to assess the air emissions impact of the designated power sources used by *CSG* to satisfy the demand for electricity through the ReGen product.
- 4) Reviewed the Massachusetts Division of Energy Resources regulations for a Renewable Portfolio Standard to determine the eligibility of *CSG* energy purchases to qualify under the regulations as “new renewables”.

### 2.2 Power Purchase Audit

We reviewed the information provided by *CSG* regarding the amount of electricity purchased from Highland/Union and generated by Sun Power. Purchase invoices were provided and compared to this information. The following Table 2.1 summarizes the results.

**Table 2.1 Comparisons of Reported Purchases to Reported Sales**

Month	Reported Generation from Sun Power (kWh/mo.)	Invoiced Generation from Sun Power (kWh/mo.)	Reported CSG Purchases from Highland/Union (kWh/mo.)	Invoiced CSG Purchases from Highland/Union (kWh/mo.)	Discrepancies (Y/N)
Dec-00	N/A	N/A	785258	785258	N
Jan-01	3279	3279	906819	906819	N
Feb-01	4461	4461	694651	694651	N
Mar-01	6476	6476	619375	619375	N
Apr-01	7852	7852	722194	722194	N
May-01	8627	8627	709697	709697	N
Jun-01	9255	9255	647712	647712	N
Jul-01	7942	7942	633161	633161	N
Aug-01	6846	6846	732984	732984	N
Sep-01	5316	5316	586173	586173	N
Oct-01	3661	3661	654005	654005	N
Nov-01	2541	2541	652260	652260	N
Dec-01	2134	2134	634950	634950	N

There were no discrepancies found in the invoiced purchases versus the reported purchases. In other words, the power purchases reported by CSG match the power sales reported by Sun Power and Highland/Union.

### 2.3 ReGen Sales Audit

The audit of ReGen sales requires distinguishing the timing of deliveries and the timing of billing. Delivery begins on the first day of the next quarter year following a customer order. That is, if a customer were to order a block of ReGen on December 15, 2000, delivery would begin on January 1, 2001.

Billing is also on a quarterly basis. Customers would be billed in April of 2001 for electricity produced by Sun Power and/or Highland/Union during the first quarter of 2001 (January 1, 2001 – December 31, 2001). Additionally, if a customer were to cancel on December 15, 2000, the effective cancellation date would be January 1, 2001. With this timing in mind the Table 2.2 presents the obligations of CSG:

**Table 2.2 Obligations to Customers & CSG Purchases**

Month	Number of Blocks Purchased to Supply Customers	Total Energy Obligations to ReGen Customers (kWh/mo.)	Total Energy Purchased by CSG from Designated ReGen Power Sources (kWh/mo.)	Deficit (Y/N)
Jan-01	532	88,667	910098	N
Feb-01	532	88,667	699112	N
Mar-01	532	88,667	625851	N
Apr-01	524	87,333	730046	N
May-01	524	87,333	718324	N
Jun-01	557	87,333	656967	N
Jul-01	557	92,833	641103	N
Aug-01	557	92,833	739830	N
Sep-01	557	92,833	591489	N
Oct-01	540	90,000	657666	N
Nov-01	540	90,000	654801	N
Dec-01	540	90,000	637084	N

There were no deficiencies found in *CSG*'s obligation to customers and the amount of power purchased by *CSG* on behalf of ReGen customers. In fact, the amount of electricity purchased by *CSG* from the designated renewable sources was substantially greater than the amount needed to meet the obligations to ReGen customers.

## 2.4 Air Emissions Audit

In marketing the ReGen product *CSG* claims certain air emissions benefits resulting from the generation of electricity from ReGen power sources. *CSG* claims that the air emissions from ReGen power sources are as listed in Table 2.3:

**Table 2.3 Claimed Emissions from ReGen Resources**

ReGen Emissions Profile (lbs/MWh)			
	1998	1999	2000
SO <sub>2</sub>	0	0	0
NO <sub>x</sub>	0.9	0.8	0.7
CO <sub>2</sub>	0	0	0

In its marketing information *CSG* used the 1997 marginal emissions rates as a basis of comparison for its "Net Benefits" analysis. Marginal emissions rates are defined as the



amount of emissions from the last unit engaged to produce enough electricity to satisfy demand. “Net Benefits” refers to the difference in emissions profiles between the marginal unit and the units used by *CSG* to produce electricity.

Table 2.4 compares *CSG*’s reported marginal emissions rates to that of the 1997 MEA Report.

**Table 2.4 Marginal Emissions Rates (1997)**

<b>Marginal Emissions Rates (1997 Annual Average lbs/MWh)</b>			
	<b>As Reported by <i>CSG</i></b>	<b>1997 MEA Report</b>	<b>Difference</b>
<b>SO<sub>2</sub></b>	9.3	9.4	(.1)
<b>NO<sub>x</sub></b>	2.6	2.6	0
<b>CO<sub>2</sub></b>	1,484	1,484	0

With the exception of a small discrepancy in the reported emissions rate of SO<sub>2</sub> the *CSG* figures match that of the 1997 NEPOOL MEA Report.

Table 2.5 summarizes the net benefits to air emissions claimed by *CSG* through use of its ReGen power sources. The figures reported as net benefits are derived by subtracting the figures in Table 2.4 (“As Reported by *CSG*” column) from those reported in Table 2.3 for the respective years.

**Table 2.5 Net Benefits to Air Emissions**

<b>Net Benefits from ReGen Power Sources (lbs/MWh)</b>			
	<b>1998</b>	<b>1999</b>	<b>2000</b>
<b>SO<sub>2</sub></b>	(9.3)	(9.3)	(9.3)
<b>NO<sub>x</sub></b>	(1.7)	(1.8)	(1.9)
<b>CO<sub>2</sub></b>	(1,484)	(1,484)	(1,484)

The 2000 NEPOOL MEA Report is now available and air emissions figures for ReGen should be updated in future marketing materials. Table 2.5 below summarizes the information contained in the 2000 NEPOOL MEA report.

**Table 2.6 Marginal Emissions Rates (2000)**

<b>Marginal Emissions Rates (2000 Annual Average lbs/MWh)</b>			
	<b>As Reported by <i>CSG</i></b>	<b>2000 MEA Report</b>	<b>Difference</b>
<b>SO<sub>2</sub></b>	9.3	6.2	(3.1)
<b>NO<sub>x</sub></b>	2.6	1.9	(0.7)
<b>CO<sub>2</sub></b>	1,484	1,488	4

This table illustrates the changes in the emissions characteristics of the marginal units between 1997 and 2000. The implications of using the 1997 data are that the net benefits

for SO<sub>2</sub> and NO<sub>x</sub> will tend to be overstated, while the net benefits associated with CO<sub>2</sub> will be slightly understated.

The 2000 MEA Report was not released until February of 2002. For the time period of our audit (January 1, 2001 – December 31, 2001) the 2000 MEA Report was not available. In the future, the emissions characteristics of the marginal units should be updated in the *CSG* literature to reflect the most up to date information available. In whole, however, *CSG* has exceeded its power purchase obligations and consequently its air emissions claims have also exceeded its claims.

## 2.5 Massachusetts Renewable Portfolio Standard

Massachusetts' 1997 restructuring legislation required the establishment of a renewable portfolio standard (RPS) that was to be developed by the Massachusetts Division of Energy Resources (DOER). The DOER was directed to develop regulations to define the scope, applicability, and implementation of a Massachusetts RPS. After an intensive stakeholder process over a three-year period, the RPS regulations were promulgated in April 2002. Starting in the first quarter of 2003, retail electric service providers will be required to demonstrate that at least one percent (1%) of the electricity purchased for retail Massachusetts customers was provided by qualifying renewable generation resources. The requirement increases by one-half percent each year for the next six years, reaching a total of four percent (4%) for the year 2009.<sup>1</sup>

The regulations define the fuel sources that allow a generation unit to qualify as a “new renewable generation unit” for purposes of compliance.<sup>2</sup> The generation unit, with some exceptions, must have begun operation after December 31, 1997, to qualify as a “new” renewable.<sup>3</sup> An owner of a generation unit that seeks a designation as a “new renewable generation unit” must file an application with DOER to be certified.<sup>4</sup>

Based on the plain language of the regulations, it would appear that the output from Sun Power generation (solar photovoltaic energy) and Highland/Union generation (landfill methane gas) both qualify as “new renewable” fuels. Assuming generation of electricity began sometime after December 31, 1997, all the electricity output should qualify as eligible for RPS compliance under the Massachusetts regulations.

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<sup>1</sup> 225 CMR 14.07.

<sup>2</sup> *Id.*, at 14.05(1)(a).

<sup>3</sup> *Id.*, at 14.05(1)(b).

<sup>4</sup> *Id.*, at 14.06.

### 3. Conclusions

Upon inspection of the information provided by *CSG* and the information relied upon from outside sources, we find that *CSG* purchased a sufficient amount of power from the designated ReGen power sources to meet its obligations to their ReGen customers. In fact, the amount of electricity purchased by *CSG* from the designated renewable sources was substantially greater than the amount needed to meet the obligations to ReGen customers. The air emissions information presented is reasonable for the time frame of the audit, but should be updated in the future. The generation resources used by *CSG* to meet its obligations are eligible to qualify as “new renewable resources” pursuant to the Massachusetts RPS regulations.