Memo

To: Report Readers

From: Bryan Garcia, Director of Energy Market Initiatives

Date: 8/1/2006

Re: Program Analysis and Monitoring and Evaluation Plan for the Connecticut Clean Energy Fund's Public Awareness, Education, and Voluntary Market Demand Initiatives – April 2006

The attached report, entitled *Program Analysis and Monitoring and Evaluation Plan for the Connecticut Clean Energy Fund's Public Awareness, Education, and Voluntary Market Demand Initiatives*, submitted by Nexus Market Research (NMR), establishes a monitoring and evaluation plan, clarifies program goals, and assesses 2005 program progress for CCEF's Program Goal 3.[1] This report is part of the Connecticut Clean Energy Fund's monitoring and evaluation program.

The CCEF, under Program Goal 3 has established the following program objectives:

- 0.5% of electricity demand will come from voluntary purchases of clean energy resources.[2]
- Drawing from a baseline survey, there will be a significant increase in the knowledge and awareness of the benefits and availability of clean energy resources by Connecticut ratepayers.[3]
- Support initiatives that prepare the next generation of innovators and consumers to address the challenges that society faces in creating a sustainable energy system.[4]

[1] Connecticut's citizens and institutions will recognize the important role of clean renewable energy and its benefits to society by becoming actively engaged in community-based activities and programs that support clean energy throughout the state.
[2] This objective is to be achieved by the end of 2007.
[3] This objective is to be achieved by the middle of 2007.

As indicated by the NMR report, progress on these objectives has been made, although it is still too early to tell the ultimate success as the CCEF works towards achieving these goals by 2007. By working with our cross-sector partners and building awareness and support for clean energy among Connecticut's residents, businesses, and institutions, we believe we are on the right path forward to achieving the three year goals.

For more information on how clean energy is growing within our communities, please visit www.ctcleanenergy.com/communities or for program progress information go to www.ctcleanenergy.com/communities/progress.

Thank you for reading this report. The more we understand how our programs are affecting the market for clean energy, the better we can make clean energy a larger part of the solution to our society's pressing challenges.

[4] This is a new objective and there is not yet a monitoring and evaluation program in place to assess program progress.

Program Analysis and Monitoring and Evaluation Plan for the Connecticut Clean Energy Fund's Public Awareness, Education, and Voluntary Market Demand Initiatives

Final Evaluation Report for 2005
April 24, 2006

Submitted to:
The Connecticut Clean Energy Fund

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Executive Summary

In summary, NMR's assessment of program progress in 2005 is positive but inconclusive.

- Changes in public awareness have not been measured since the baseline study in March 2005. The first follow up survey to the baseline public awareness study is scheduled for April of 2006, and changes in estimated awareness indicators need to exceed 3% to 4% to be measurable.
- Awareness-raising programs and media activity increased in intensity, which is a leading indicator of raised public awareness and knowledge.
- Total signups (6,654) to the CTCleanEnergyOptions[sm] program exceeded regulatory goals and the prior competitive clean energy market program experiences within Connecticut.
- Voluntary purchasing exceeds the experiences of other regional programs (MA and RI).
- Community-based programs sponsored by the CCEF probably contributed in a substantial way to the early success of the Clean Energy Options Program.

As part of its monitoring and evaluation programs, the Connecticut Clean Energy Fund (CCEF) tasked Nexus Market Research (NMR) to conduct a comprehensive Program Analysis and Comparative Program Assessment, and to develop a Monitoring and Evaluation Plan for CCEF's Program Goal 3. This report first presents the context and framework within which the assessment of CCEF's voluntary initiatives will be conducted, followed by a summary of program progress in 2005. The next section of this document focuses on the Program Theory and Logic of Program Goal 3, including program objectives, barriers, comparable practices by similar programs, implementation approaches, and a summary of individual program elements. The last section of this document proposes a Monitoring and Evaluation Plan for the Connecticut Clean Energy Fund's (CCEF) Program Goal 3 activities. The intended audience of this document includes CCEF Program Managers, CCEF Board Members, and key CCEF stakeholders.

According to CCEF's Strategic Focus (2004-2007),[1] an operational understanding of the CCEF mission is as follows:

> *The Connecticut Clean Energy Fund invests in enterprises and other initiatives that promote and develop sustainable markets for energy from clean energy sources for the benefit of Connecticut ratepayers.*

The Strategic Focus continues by presenting three strategic goals and objectives, of which Program Goal 3 is as follows:

> *The CCEF will play a significant role in increasing consumer knowledge of clean energy and in consumers actively seeking and adopting clean energy technology for their homes, businesses, and institutions.*[2]

[1] http://www.ctcleanenergy.com/about/documents/StrategicFocus2004-2007_000.pdf

The Public Awareness, Education, and Voluntary Market Demand Initiatives are implemented under Program Goal 3, supporting two strategic objectives:[3]

1. ***Objective 3A*** *– 0.5% of electricity demand[4] will come from voluntary purchases of clean energy resources.*
2. ***Objective 3B*** *– Drawing from a baseline survey, there will be significant increase in the knowledge and awareness of the benefits and availability of clean energy resources by Connecticut residents.[5]*

Objective 3A Summary (2005)

The Connecticut Clean Energy Options Program, under the direction of the Connecticut Department of Public Utility Control (DPUC), nearly doubled the regulatory signup goals in 2005, with greater penetration rates in municipalities participating in the 20% by 2010 campaign compared to nonparticipating municipalities, and experiencing the most signups and community commitments in the most populated municipalities along the Hartford-New Haven corridor.

The Clean Energy Options Program kicked off on April 1, 2005, and total participation (commercial and residential) increased quickly in the second quarter (through June 30, 2005) with 3,491 participants, accounting for 3,025 signup equivalents (or "points")[6]. This strong early participation in the second quarter alone nearly matched the participation levels of prior green power programs in Connecticut (roughly 3,500 total participants during the 2000 to 2003 time period). Participation continued to climb throughout the year, increasing by 42% in the third quarter and 35% in the fourth quarter in terms of participation points. By the end of 2005, the vast majority of participants were residential, accounting for 99% of the total 6,654 participants or 5,802.5 signup points.

Much of the early (April through June, 2005) participation success can reasonably be attributed to community-based marketing programs sponsored by CCEF, namely SmartPower's 20% by 2010 campaign and the Connecticut Clean Energy Communities Program. Most signups during 2005 occurred through the bill insert mechanism; whether those who signed up through the inserts did so through, or were influenced by, a CCEF-related event, advertisement, program, or marketing is unclear Of the 165 (out of 169) municipalities eligible to participate in the Clean Energy Options Program seven municipalities had committed to the 20% by 2010 campaign

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[2] As of March 31, the language under Program Goal 3 has changed to say: "Connecticut's citizens and institutions will recognize the important role of clean renewable energy and its benefits to society by becoming actively engaged in community-based activities and programs that support clean energy throughout the state."

[3] As of March 31, a strategic objective (Objective 3C) will be added as: "Support initiatives that prepare the next generation of innovators and consumers to address the challenges that society faces in creating a sustainable energy system."

[4] Objective 3A goal is to be achieved by the middle of 2007.

[5] As of March 31, the language under Program Objective 3B has changed to say: "Drawing from a baseline survey, there will be measurable increase in the knowledge and awareness of the benefits and availability of clean energy resources by Connecticut ratepayers."

[6] One signup point is equal to one household signup that agrees to purchase 100% of their electricity through the Clean Energy Options Program, or two household signups that agree to purchase 50% of their electricity each through the Clean Energy Options Program.

prior to April 1, 2005—the first date of eligibility for the Clean Energy Options Program. Of those seven backlogged municipalities, three qualified as Connecticut Clean Energy Communities during the second quarter 2005. Of the sixteen municipalities participating in the 20% by 2010 campaign by the end of 2005, twelve of them joined before the end of the second quarter—or the first quarter of the Clean Energy Option Program eligibility. Additionally, five of the top ten municipalities in signup points as of June 30, 2005 were also 20% by 2010 participants by the end of that quarter, and four out of those five municipalities were backlogged 20% by 2010 participants.

Table ES-1 displays how participating municipalities in the 20% by 2010 campaign and the Clean Energy Communities Campaign represent a disproportionate number of signups to the Clean Energy Option versus nonparticipating municipalities in the first quarter of the Clean Energy Options Program. For example, as of June 30, 2005 the top ten municipalities represented 6% of eligible municipalities (10 of 165) and 19% of CT households but 31% of signup points. The top three—all CT Clean Energy Communities in the first quarter of the program—represented 2% of municipalities and 12% of CT households but 15% of signup points. The seven backlogged 20% by 2010 municipalities—those which had joined the campaign prior to kickoff on April 1, 2005, represented 4% and 12% of municipalities and CT households respectively, but 19% of signup points. Including all municipalities that committed to the 20% by 2010 campaign by June 30, 2005, the signup points (25%) also represent a disproportionate number relative to the proportion of municipalities (7%) and CT households (19%).

Table ES-1: Household Penetration by 20% by 2010 Participants (Q2, 2005)

	Municipalities	Households	Signup Points (Q2)	Household Singups (Q2)
Top 10 municipalities (Including five 20% by 2010 municipalities and three Clean Energy Communities)	10	245,555	929.5	1047
% of CT Total	6%	19%	31%	30%
Top 3 municipalities (All CT Clean Energy Communities)	3	92,994	468	525
% of CT Total	2%	7%	15%	15%
% of Top 10			50%	50%
Backlogged 20% by 2010 (7 municipalities joining the campaign prior to April 1, 2005)	7	156,591	562.5	641
% of CT Total	4%	12%	19%	18%
All 20% by 2010 Participants (12 municipalities joining the campaign prior to June 30, 2005)	12	243,984	766	873
% of CT Total	7%	19%	25%	25%

Municipalities participating in either the 20% by 2010 campaign or the Clean Energy Communities Program maintained greater household penetration rates than nonparticipating municipalities throughout 2005. Table ES-2 summarizes average household penetration for municipalities participating in the 20% by 2010 campaign versus nonparticipating municipalities. In 2005, penetration rates in participating municipalities clearly exceed those of nonparticipating municipalities by at least 70%, and held steady throughout 2005.

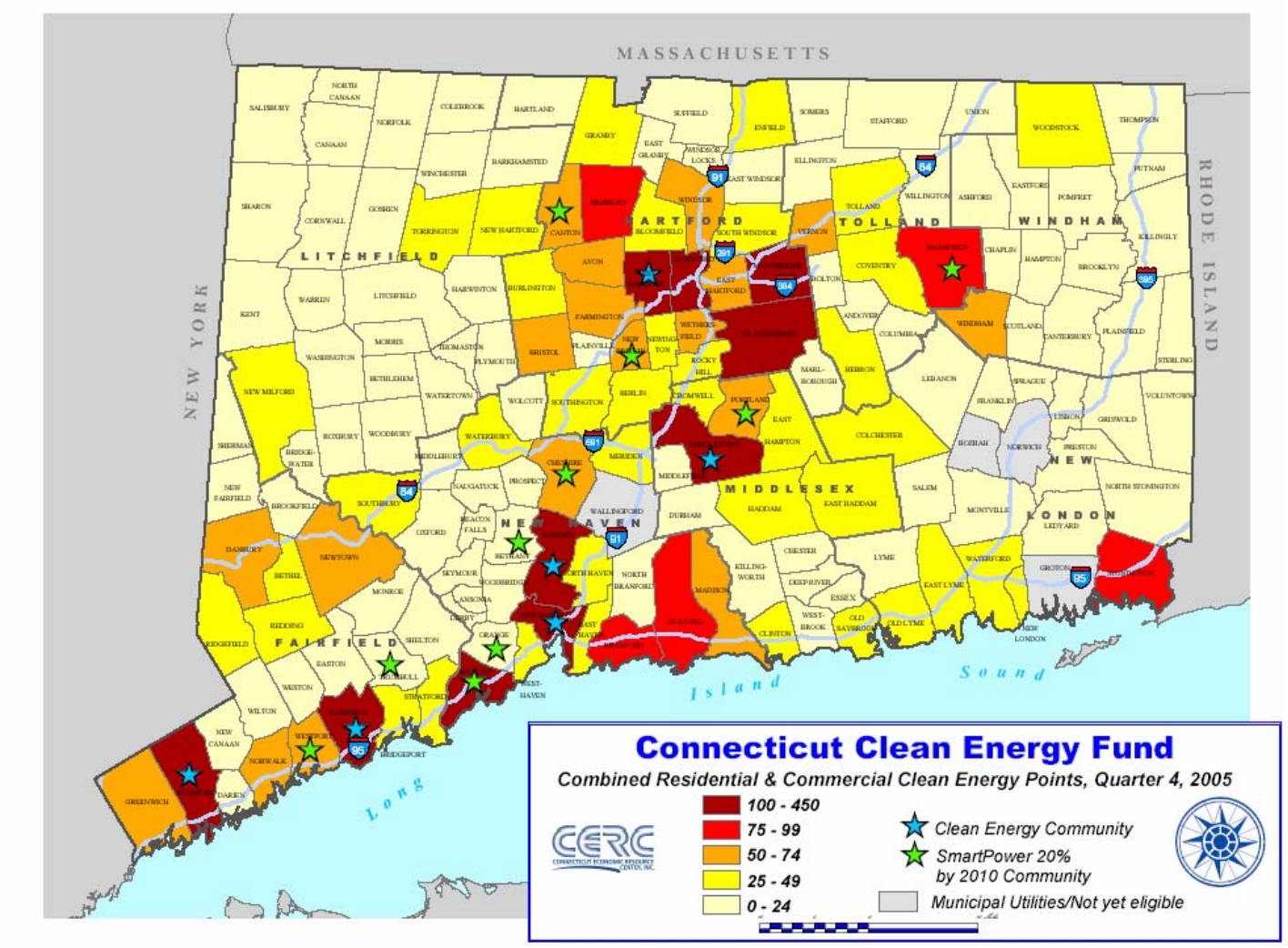
Table ES-2: Average Household Penetration by 20% by 2010 Participants versus Nonparticipants

Quarter	Number of 20% by 2010 Participants	Number of Qualifying Clean Energy Communities	Participating Communities Household Penetration	Nonparticipating Communities Household Penetration	Participant to Nonparticipant Ratio
2nd	12	3	0.57%	0.33%	1.7 : 1
3rd	16	3	0.82%	0.45%	1.8 : 1
4th	16	6	1.1%	0.61%	1.8 : 1

Generally speaking, program participation tends to track with community commitments to the 20% by 2010 campaign and the Connecticut Clean Energy Communities Program over time. Signups and community commitments, however, also tend to coincide with the most populated municipalities along the Hartford-New Haven corridor. Under Program Objective 3B, SmartPower conducted a television and radio advertising campaign (of nearly $200,000 in paid media) prior, during, and after the launch off the Clean Energy Options Program to raise awareness on clean energy and of the program itself (see Figure ES-3). This paid media campaign was targeted specificially toward the Hartford-New Haven corridor[7]. Figure ES-1 displays a Connecticut map, by municipality, of total (commercial and residential) signups, sixteen community commitments to 20% by 2010, and six Connecticut Clean Energy Communities for the fourth quarter of 2005. As of December 31, 2005, actual participation per municipality is low and the majority of municipalities fall into the lowest two categories (e.g., 49 signups or less). Only ten municipalities fall into the highest category of 100 or greater with New Haven having the highest number of signups at 434, followed by West Hartford at 420.

[7] The Fairfield County media market was not selected for the paid media campaign because of the high cost of advertising in the New York City media market.

Figure ES-1: Signups versus 20% by 2010 and Connecticut Clean Energy Communities by Municipality (Quarter 4, 2005)



Objective 3B Summary (2005)

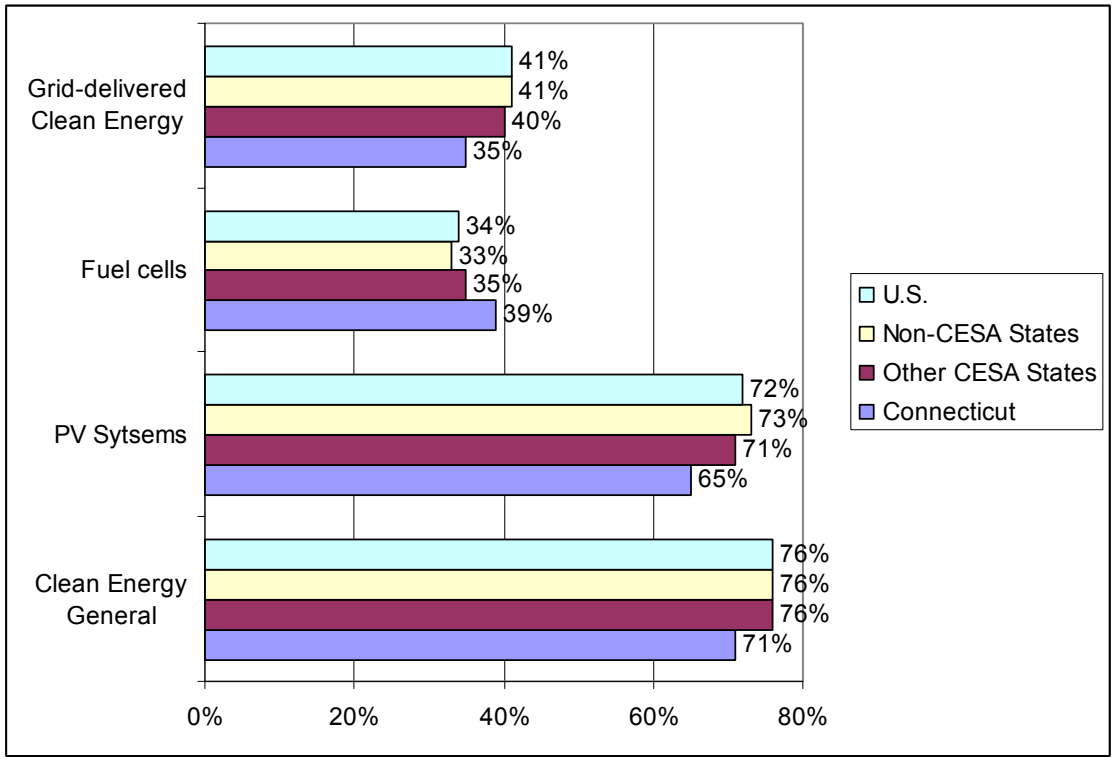
In early 2005, CCEF found that Connecticut residents are no more likely to be aware of clean energy than the rest of the nation, that the total value of paid advertising and earned media in 2005 was $826,782 (of which $246,687 was paid and $580,095 was earned media value), and although direct print media coverage of CCEF programs was limited, general coverage of climate change and clean energy issues, which indirectly benefits the fund's public awareness and education programs, increased substantially throughout 2005 and has increased even more dramatically compared to coverage in 2004.

During 2005 CCEF funded a number of programs to raise awareness and educate the public on clean energy technologies and participation opportunities. NMR conducted a baseline study prior to the launch (April 1, 2005) of the Connecticut Clean Energy Options Program to assess current levels of public awareness and knowledge of clean energy in Connecticut and across the country. Briefly, the study methodology included the following telephone surveys:

- Connecticut energy bill-payers (600 respondents)
- National survey of homeowners (943 respondents)

Figure ES-2 shows some basic indicators of clean energy awareness. The key conclusion from this study, prior to the launch of the Connecticut Clean Energy Options Program is that Connecticut residents are in general no more likely to be aware of clean energy than people living elsewhere in the country.

Figure ES-2: Clean Energy Awareness in Connecticut and Comparison Groups

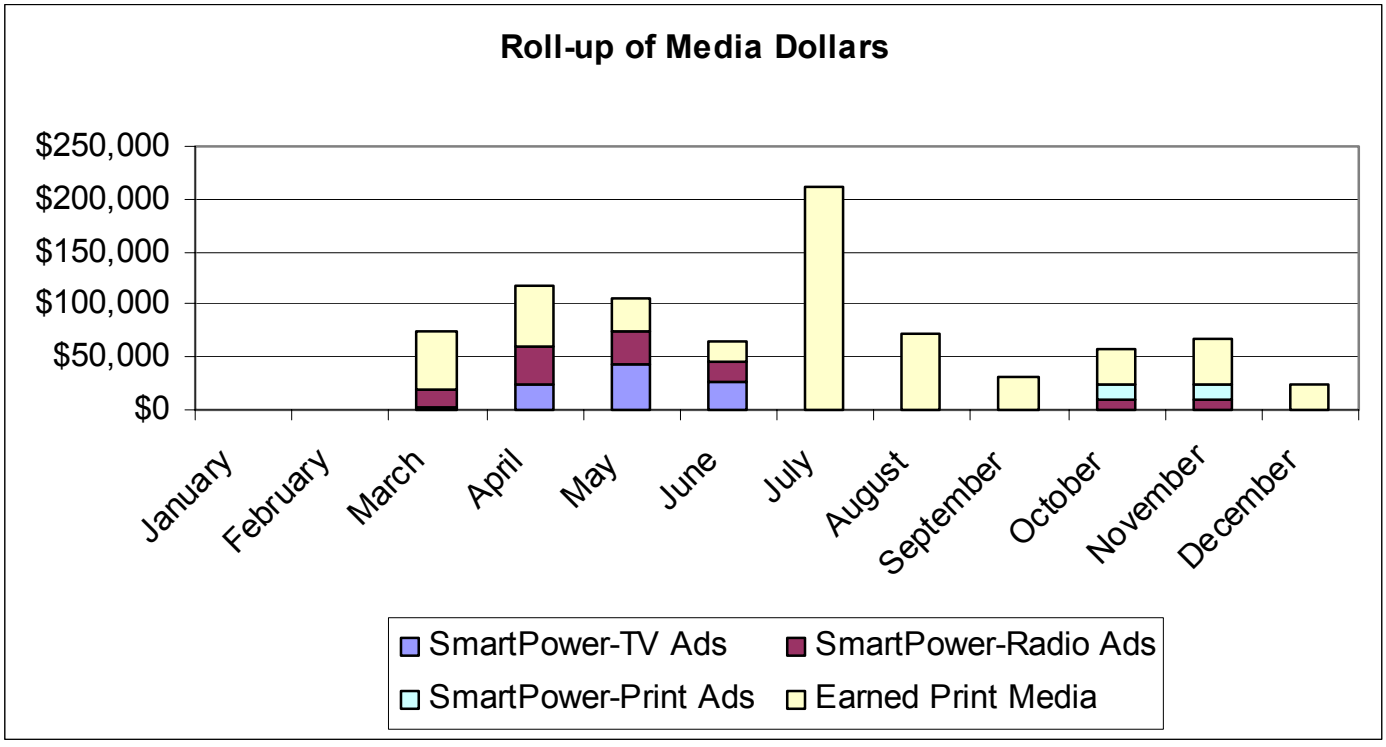


Program Goal 3B monitoring and evaluation activities also included a Media Activity Assessment, which included the following:

- Quarterly reports of indicators of media coverage and awareness-raising activities
- Data collected and tabulated on a monthly basis
- Qualitative assessment of media "buzz" (free and earned media) about clean energy in relation to CCEF program

Media activity on CCEF programs during 2005 was sporadic, with the majority of activity, including both paid and earned media, focused around the launch of the program, followed by reasonably steady earned media coverage. Figure ES-3 shows media activity in terms of dollars, and the total value of paid advertising and earned media in 2005 was $826,782 (of which $246,687 was paid and $580,095 was earned media value). This graph is limited, however, due to the unavailability of data on some unpaid television and radio coverage of CCEF programs, and because of a spike in earned media dollar equivalents due to a Newsweek article on SmartPower featuring Connecticut on July 1, 2005.

Figure ES-3: Media Summary (2005): TV, Radio, and Print [8, 9, 10] (Cumulative Graph)



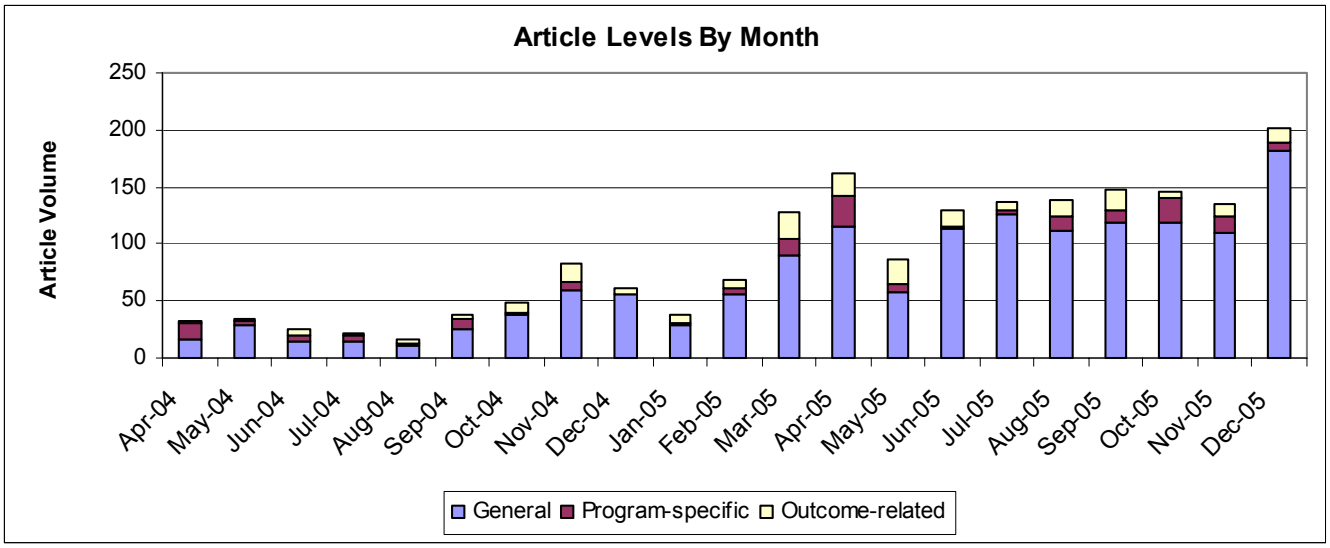
[8] Earned print media in the roll-up graph only include relevant earned or free media, or program-specific or outcome-related articles, where program-specific articles directly mention CCEF, Project 100, CT Clean Energy Communities, etc and outcome-related articles are about long-term program outcomes such as purchases of clean energy, non-purchase commitments, etc. Outcome-related articles overwhelmingly tend to mention CCEF program specifics.

[9] Source: Yankee Clipper and SmartPower

[10] The spike in July is largely due to a Newsweek article on SmartPower featuring Connecticut on July 1, 2005

Overall print media coverage of climate change and clean energy issues increased substantially throughout 2005, and has increased even more dramatically compared to coverage in 2004. Coverage of CCEF programs, however, was a limited but fairly steady part of the overall print coverage. While general articles do not directly serve the purpose of promoting awareness of CCEF programs, it does raise general awareness about issues directly relevant to those programs. A summary graph of print media data since April 2004 is shown in Figure ES-4.

Figure ES-4: Print Data: Earned/Free Media[11]—Cumulative, April 2004 – December 2005[12]



Program Analysis

This section of the document identifies, describes, and evaluates the current portfolio of activities, expected outcomes, and external influences with regard to Program Goal 3, from the base year beginning in July of 2004 (based on the Strategic Focus document for 2004-2007) and for implementation activities currently approved and underway as of December 2005.

Clean energy markets in Connecticut are in their early stages of development. Legislative, regulatory, and program elements have been put in place to support such markets. The goal of having an increasing share of electricity consumed and produced in the state coming from clean energy sources, however, will only be met once a range of barriers affecting both consumers and clean energy providers are gradually overcome. The barriers that CCEF is addressing in Program Goal 3 are embedded in CCEF's operational mission statement, with the key words being "sustainable" to qualify the market conditions for clean energy, and for the "benefit" of Connecticut's ratepayers.

[11] Earned print media includes relevant earned or free media, or program-specific or outcome-related articles. Program-specific articles directly mention CCEF, Project 100, CT Clean Energy Communities, etc, and outcome-related articles are about long-term program outcomes such as purchases of clean energy, non-purchase commitments, etc. Outcome-related articles overwhelmingly tend to mention CCEF program specifics.
[12] Source: Yankee Clipper

The implications for the remainder of this section are addressed in the Recommendations section.

Monitoring and Evaluation Plan

This section of this document identifies, describes, and evaluates indicators to measure the performance of the current portfolio of CCEF activities, including program outputs and expected outcomes with regard to Program Goal 3, from the base year beginning July 2004 (based on the Strategic Objectives document for 2004-2007), and for implementation activities currently approved and underway as of December of 2005.

The monitoring and evaluation plan starts with a program logic model and associated tables of metrics and indicators of program performance referenced within that program logic model. A program logic model is an evaluation and a program planning tool, expressed in graphic form, used to summarize the interrelationships among evaluation activities, expressed in terms of a logical progression of performance indicators. In summary, the proposed metrics are indicators of performance, but not necessarily the definitive story, and the logic model provides some context for the indicators specified. As additional initiatives are approved and funded, they will be integrated into the program logic model and appropriate metrics and indicators will be identified and developed as well.

The implications for the remainder of this section are addressed in the Recommendations section.

Recommendations

In this section, NMR presents recommendations regarding the design and implementation of Program Goal 3.

On balance, the CCEF is following known practices with respect to developing a voluntary market for clean energy in Connecticut. Many of these known practices are directly under the control of CCEF; others are embedded in the statutory and/or regulatory structure of the Alternative Transitional Standard Offer (ATSO) program itself, in which CCEF may or may not have had any input.

Some of the most important short-term outcomes expected to result from CCEF's activities include increasing voluntary signups, and increasing public understanding and knowledge of the role of energy in society, clean energy technologies, and the climate change issue.

There are two primary sets of activities aimed at achieving these outcomes.

The first set of activities consists of SmartPower's 20% by 2010 Campaign and public awareness programs. SmartPower is a 501(c)3 non-profit organization co-founded in late 2002 by the Connecticut Clean Energy Fund and five foundations: the John Merck Fund, Rockefeller Brothers Fund, Pew Charitable Trusts, Emily Hall Tremaine Foundation, and Surdna Foundation. The SmartPower investment was initiated to develop clean energy marketing campaigns and programs in Connecticut with the expectation of national replication and rollout, leveraging additional dollars to grow the overall outreach program. CCEF relies heavily on SmartPower to achieve most of its expected short-term outcomes of the CCEF voluntary

initiatives. For example, a municipality must commit to SmartPower's 20% by 2010 campaign to qualify for CCEF's Community Innovations Grants Program.[13]

The second set of activities comprises public education initiatives carried out by the Connecticut Center for Science and Exploration (CTCSE) and the Connecticut Science Center Collaborative (CSCC). Both CTSCE and CSCC focus on informal education programs rather than teacher training. CCEF envisions CTSCE and CSCC developing into a network that fosters innovative ways of educating the state's residents on clean energy technologies as a solution to climate change and thus cultivating future clean energy consumers—the latter of which is a long-term outcome.

The time-horizons for the stated program outcomes—especially the intermediate and long-term outcomes—may be unrealistically aggressive. The time-horizons of the outcome structure (Short-term Outcomes 0-3 Years; Intermediate-term Outcomes 0-6 Years; Long-term Outcomes 6+ Years) were assumed based on the need to coincide with various stated program targets. Numerous studies show the potential for developing the clean energy market in Connecticut and the receptivity of its citizens to clean energy messaging.[14, 15] In 2004, however, clean energy purchasing programs across the nation experienced relatively slower growth than years past—which was already at a modest growth rate—and even the longest running programs have not realized some of its desired outcomes (e.g., purchasing activity, capacity development, etc.) expected within the time frames specified above.[16, 17]

In order to achieve the goals established in the Strategic Focus, NMR specifically recommends the following

1. **Establish a "dashboard" for both Program Goal 3 objectives on the CCEF Web site.** Dashboards are methods for communicating program performance, represented by a select subset of program performance metrics, and not performance monitoring systems by themselves. A properly specified dashboard, linked to indicators from the M&E plan, can nonetheless provide a useful synopsis of Program Goal 3 performance for program partners and stakeholders.

2. **Adopt and communicate a longer-term outlook.** The time horizon for developing clean energy markets is long—much longer than the current three-year planning period of the Strategic Focus. Adding to the complexity of long-term program planning, the Clean

[13] The Community Innovations Grants Program was authorized by the CCEF Advisory Board in December 2005, and should diversify public awareness raising implementation efforts in 2006.
[14] Hoefgen, Lynn, Tom Mauldin, Tim Pettit (NMR), and Bryan Garcia (Connecticut Innovations). Comparative Assessment of Consumer Awareness for Clean Energy in Connecticut and the United States (Final Report), submitted to the Connecticut Clean Energy Fund, May 18, 2005.
[15] Clean Energy Market Assessment of Southern New England: Final Report. Booz-Allen & Hamilton, June 25, 2001.
[16] Farhar, B., 1999. Willingness to Pay for Electricity from Renewable Resources: A Review of Utility Market Research, NREL/TP-550-26148. Golden, CO: National Renewable Energy Laboratory, July. http://www.eere.energy.gov/greenpower/farhar_26148.html.
[17] Bird, Lori and Elizabeth Brown, National Renewable Energy Laboratory (NREL), Trends in Utility Green Pricing Programs (2004). Technical Report, NREL/TP-620-38800, October 2005.

Energy Options Program is officially set to expire in 2008. The three-year cycle can be disruptive to the nascent infrastructure and community stakeholder networks that are developing and make future implementation efforts more difficult. To the extent practical, consider extending the period of the next Strategic Focus document from three years to at least five years. In addition, incorporate into the planning process the outcomes framework (short, intermediate, and long-term) specified in the program logic model, along with realistic time horizons. Communicate this long-term outlook to community stakeholders and partners.

3. **Maintain and enhance coordination activities with regional clean energy programs.** CCEF took the lead in facilitating regional clean energy program coordination by founding SmartPower, and continuously reaching out to, and sharing with, regional programs on implementation and marketing issues. This openness has facilitated considerable regional cooperation and has been a real source of strength in implementing the Program to date. While CCEF still makes relatively greater efforts than its regional partners to coordinate state funding to leverage advertising dollars and regional messaging strategies, it should continue its efforts to expand opportunities for regional coordination. New England is a regionally small but densely populated area with relatively few media markets, and consistent messaging will have more regional impact with proper coordination.

4. **Emphasize the long-term vision for solar incentives through Program Goal 3.** CCEF should ensure that solar incentive and demonstration projects through Program Goal 3 (e.g., Connecticut Clean Energy Communities Program) are installed based on their lifetime viability. Solar panels last a long time (warranties exceed 20 years) but the benefits can only be realized through regular routine servicing and maintenance of the inverters, net meters, and transformers, all of which last only a few years. Solar systems need some form of clear ownership over their lifetime. Based on conversations with other Clean Energy States Alliance (CESA) program managers, many solar incentive and demonstration programs do not firmly impart specific ownership and fail as a result.

5. **Focus school-based education on teacher training.** Onsite school-based education activities should focus on teacher training and working with teachers who seek to learn about clean energy. Teachers in the K-5 segment are especially deficient in science expertise; and science topics in general need to be hands-on, inquiry-based, and properly grounded in the state's pedagogical standards. Moreover, topics such as clean energy require experiments and consumables that are not standard school-provided resources. The pace of implementation will be slow when focusing on teachers; however, the focus on teacher training will also increase the likelihood that children will be impacted by the programs—an important concern when considering the direct energy benefits of the program will not be realized for many years, and are not practically measurable.

6. **Explore opportunities for alignment with EPA's Green Power Communities, CT Clean Energy Communities, and SmartPower's 20% by 2010 programs.** As Connecticut communities organize to the model of community pride/participation programs, maintaining consistent opportunities to enhance participation in the CT Clean

Energy Communities program could be important. For example, the 20% by 2010 campaign is a prerequisite for communities to qualify for becoming a CT Clean Energy Community. The EPA Green Power Communities is a pilot program with potentially high visibility due to its highly trusted and recognized sponsor—the US EPA. Aligning program incentives may help facilitate further clean energy purchasing and participation in the CT Clean Energy Communities Program.

7. **Consider exploring a municipal-based model for the remaining four municipalities ineligible for Connecticut Clean Energy Options.** The highly successful Austin, TX model represents a possible opportunity for CCEF to propose clean energy program opportunities with the Connecticut municipal electricity suppliers through the policy-making process. One reason for the success of the Austin, TX model is the opportunity it presents customers to insure themselves against long-term increases in regulated fuel charges from conventionally generated electricity use when purchasing clean energy. As conventional fuel rates increase over time, clean energy prices should become more economic or close the gap regardless of the clean energy generation source. A municipal program which freezes conventional fuel rates—or eliminates the fuel charges altogether—over the term of a long-term clean energy purchase allows market mechanisms to function better than tying the price premium of clean energy to the fuel costs of electricity from conventional sources. By communicating the potential benefits and applicability of the Austin, TX model to the Department of Public Utility Control and to legislative representatives, CCEF may be able to influence the degree to which such a successful program model can be applied to the municipal electricity suppliers.

8. **Revisit and revise program logic and M&E plan in 2007.** CCEF plans to revise the current Strategic Focus in 2007. The Program Logic Model and M&E plan should be updated to reflect all program changes since the production of this document, enabling the new CCEF Strategic Focus to address any ambiguities between the updated program objectives and innovative program implementation activities. For example, the "Let's Make More" campaign may need to be refreshed, as all campaigns do, after its three year run. A new campaign may be implemented very differently, with different indicators of program progress. Therefore, the program logic and M&E plan should be updated accordingly.

1 Introduction and Background

As part of its monitoring and evaluation programs, the Connecticut Clean Energy Fund (CCEF) tasked Nexus Market Research (NMR) to conduct a comprehensive Program Analysis and Comparative Program Assessment, and to develop a Monitoring and Evaluation Plan for CCEF's Program Goal 3. This report first presents the context and framework within which the assessment of CCEF's voluntary initiatives will be conducted followed by a summary of program progress in 2005. The next section of this document focuses on the Program Theory and Logic of Program Goal 3, including program objectives, barriers, comparable practices by similar programs, implementation approaches, and a summary of individual program elements. The last section of this document proposes a Monitoring and Evaluation Plan for the Connecticut Clean Energy Fund's (CCEF) Program Goal 3 activities. The intended audience of this document includes CCEF Program Managers, CCEF Board Members, and key CCEF stakeholders.

According to CCEF's Strategic Focus (2004-2007)[18], an operational understanding of the CCEF mission is as follows:

> *The Connecticut Clean Energy Fund invests in enterprises and other initiatives that promote and develop sustainable markets for energy from clean energy sources for the benefit of Connecticut ratepayers.*

The Strategic Focus continues by presenting three strategic goals and objectives:

1. ***Program Goal 1****: Connecticut ratepayers will have access to a diverse supply of installed clean energy resources.*
2. ***Program Goal 2****: CCEF will support the early stage development of the clean energy industry in Connecticut.*
3. ***Program Goal 3****: The CCEF will play a significant role in increasing consumer knowledge of clean energy and in consumers actively seeking and adopting clean energy technology for their homes, businesses, and institutions.*[19]

[18] http://www.ctcleanenergy.com/about/documents/StrategicFocus2004-2007_000.pdf

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The Public Awareness, Education, and Voluntary Market Demand Initiatives are implemented under Program Goal 3, supporting two strategic objectives:[20]

1. ***Objective 3A*** *– 0.5% of electricity demand[21] will come from voluntary purchases of clean energy resources.*
2. ***Objective 3B*** *– Drawing from a baseline survey, there will be significant increase in the knowledge and awareness of the benefits and availability of clean energy resources by Connecticut residents.[22]*

In summary, NMR's assessment of program progress in 2005 is positive but inconclusive.

- Changes in public awareness have not been measured since the baseline study in March 2005. The first follow up survey to the baseline public awareness study is scheduled for April of 2006, and changes in estimated awareness indicators need to exceed 3% to 4% to be measurable.
- Awareness-raising programs and media activity increased in intensity, which is a leading indicator of raised public awareness and knowledge.
- Total signups (6,654) to the CTCleanEnergyOptions[sm] program exceeded regulatory goals and the prior competitive clean energy market program experiences within Connecticut.
- Voluntary purchasing exceeds the experiences of other regional programs (MA and RI).
- Community-based programs sponsored by the CCEF probably contributed in a substantial way to the early success of the Clean Energy Options Program.

The remainder of this section will review program performance for 2005 for Program Goal 3 by program objective.

[20] As of March 31, a strategic objective (Objective 3C) will be added as: "Support initiatives that prepare the next generation of innovators and consumers to address the challenges that society faces in creating a sustainable energy system."
[21] Objective 3A goal is to be achieved by the middle of 2007.
[22] As of March 31, the language under Program Objective 3B has changed to say: "Drawing from a baseline survey, there will be measurable increase in the knowledge and awareness of the benefits and availability of clean energy resources by Connecticut ratepayers."

1.1 Objective 3A Summary (2005)

The Connecticut Clean Energy Options Program, under the direction of the DPUC, kicked off on April 1, 2005, and total participation (commercial and residential) increased quickly in the second quarter (through June 30, 2005) with 3,491 participants, accounting for 3,025 signup equivalents (or "points").[23] This strong early participation in the second quarter alone (and the first quarter of the program) nearly matched the participation levels of prior green power programs in Connecticut (roughly 3,500 total participants during the 2000 to 2003 time period). Participation continued to climb throughout the year, increasing by 42% in the third quarter and 35% in the fourth quarter in terms of participation points. The vast majority of participants were residential, accounting for 99% of signup points. Table 1-1 shows participation progress by quarter through the Connecticut Clean Energy Options Program.

Table 1-1: Participation in the Connecticut Clean Energy Options Program (April 1 through December 31, 2005)

	50%	100%	Total Signups	Total Points[15]	% Change (Points)
Q2	932	2,559	3,491	3,025.0	3025%
Q3	1,264	3,654	4,918	4,286.0	42%
Q4	1,703	4,951	6,654	5,802.5	35%

Much of the early (April through June, 2005) participation success can reasonably be attributed to community-based marketing programs sponsored by CCEF, namely SmartPower's 20% by 2010 campaign and the Connecticut Clean Energy Communities Program. Most signups during 2005 occurred through the bill insert mechanism; whether those who signed up through the inserts did so through, or were influenced by, a CCEF-related event, advertisement, program, or marketing is unclear Of the 165 (out of 169) municipalities eligible to participate in the Clean Energy Options Program seven municipalities had committed to the 20% by 2010 campaign prior to April 1, 2005—the first date of eligibility for the Clean Energy Options Program. Of those seven backlogged municipalities, three qualified as Connecticut Clean Energy Communities during the second quarter 2005 (and the first quarter of the program). Of the sixteen municipalities participating in the 20% by 2010 campaign by the end of 2005, twelve of them joined before the end of the first quarter of the Clean Energy Option Program. Additionally, five of the top ten municipalities in signup points as of June 30, 2005 were also 20% by 2010 participants by the end of that quarter, and four out of those five municipalities were backlogged 20% by 2010 participants.

[23] One signup point is equal to one household signup that agrees to purchase 100% of their electricity through the Clean Energy Options Program, or two household signups that agree to purchase 50% of their electricity each through the Clean Energy Options Program.

Table 1-2 displays how participating municipalities in the 20% by 2010 campaign and the Clean Energy Communities Campaign represent a disproportionate number of signups to the Clean Energy Option versus nonparticipating municipalities in the first quarter of the Clean Energy Options Program. For example, as of June 30, 2005 the top ten municipalities represented 6% of eligible municipalities (10 of 165) and 19% of CT households but 31% of signup points. The top three—all CT Clean Energy Communities in the first quarter of the program—represented 2% of municipalities and 12% of CT households but 15% of signup points. The seven backlogged 20% by 2010 municipalities—those which had joined the campaign prior to kickoff on April 1, 2005, represented 4% and 12% of municipalities and CT households, respectively, but 19% of signup points. Including all municipalities that committed to the 20% by 2010 campaign by June 30, 2005, the signup points (25%) also represent a disproportionate number relative to the proportion of municipalities (7%) and CT households (19%).

Table 1-2: Household Penetration by 20% by 2010 Participants (Q2, 2005)

	Municipalities	Households	Signup Points (Q2)	Household Singups (Q2)
Top 10 municipalities (Including five 20% by 2010 municipalities and three Clean Energy Communities)	10	245,555	929.5	1047
% of CT Total	6%	19%	31%	30%
Top 3 municipalities (All CT Clean Energy Communities)	3	92,994	468	525
% of CT Total	2%	7%	15%	15%
% of Top 10			50%	50%
Backlogged 20% by 2010 (7 municipalities joining the campaign prior to April 1, 2005)	7	156,591	562.5	641
% of CT Total	4%	12%	19%	18%
All 20% by 2010 Participants (12 municipalities joining the campaign prior to June 30, 2005)	12	243,984	766	873
% of CT Total	7%	19%	25%	25%

Municipalities participating in either the 20% by 2010 campaign or the Clean Energy Communities Program maintained greater household penetration rates than nonparticipating municipalities throughout 2005. Table 1-3 summarizes average household penetration for municipalities participating in the 20% by 2010 campaign versus nonparticipating municipalities. In 2005, penetration rates in participating municipalities clearly exceed those of nonparticipating municipalities by at least 70%, and held steady throughout 2005.

Table 1-3: Average Household Penetration by 20% by 2010 Participants versus Nonparticipants

Quarter	**Number of 20% by 2010 Participants**	**Number of Qualifying Clean Energy Communities**	**Participating Communities Household Penetration**	**Nonparticipating Communities Household Penetration**	**Participant to Nonparticipant Ratio**
2nd	12	3	0.57%	0.33%	1.7 : 1
3rd	16	3	0.82%	0.45%	1.8 : 1
4th	16	6	1.1%	0.61%	1.8 : 1

By the end of 2005, sixteen municipalities had committed to the 20% by 2010 campaign, of which six qualified as Connecticut Clean Energy Communities. Table 1-4 summarizes community commitments and participation in CCEF sponsored programs.

Table 1-4: Participation in CCEF-sponsored Community Programs (2005)

Municipality	SmartPower's 20% by 2010 Commitment Date	CCEF's Clean Energy Communities Program Qualification Date	Estimated Annual Electricity Demand[24] (kWh)
Bethany	Aug-05		780,000
Canton	Apr-05		3,300,000
Cheshire	Aug-05		11,766,000
Fairfield	Feb-05	Nov-05	24,700,000
Hamden	Jul-05	Oct-05	17,900,000
Mansfield	Jul-05		6,000,000
Middletown	May-05	Jun-05	16,500,000
Milford	Jan-05		21,000,000
New Britain	Feb-05		18,100,000
New Haven	Feb-04	Jun-05	80,000,000
Orange	May-05		825,500
Portland	Nov-04		4,300,000
Stamford	Apr-05	Nov-05	58,300,000
Trumbull	Jun-05		
West Hartford	Jan-05	Jun-05	18,600,000
Westport	Mar-05		16,700,000
Total	**16**	**6**	**298,771,500**

[24] This goal represents the electric load for municipal facilities only. The 20% goal is comprised of 7% from mandatory (RPS) and 13% from voluntary clean renewable sources by 2010.

Figures 1-1 through 1-3 display Connecticut maps, by municipality, of total (commercial and residential) signups, community commitments to 20% by 2010, and Connecticut Clean Energy Communities for quarters two through four of 2005, respectively. Generally speaking, program participation tends to track with community commitments to the 20% by 2010 campaign and the Connecticut Clean Energy Communities Program over time. Signups and community commitments, however, also tend to coincide with the most populated municipalities along the Hartford-New Haven corridor. Under Program Objective 3B, SmartPower conducted a television and radio advertising campaign (of nearly $200,000 in paid media) prior, during, and after the launch off the Clean Energy Options Program to raise awareness on clean energy and of the program itself (see Figure 1-5). This paid media campaign was targeted specificially toward the Hartford-New Haven corridor[25]. As of December 31, 2005, actual participation per municipality is low and the majority of municipalities fall into the lowest two categories (e.g., 49 signups or less). Only ten municipalities fall into the highest category of 100 or greater with New Haven having the highest number of signups at 434, followed by West Hartford at 420.[26]

[25] The Fairfield County media market was not selected for the paid media campaign because of the high cost of advertising in the New York City media market.

[26] The top 10 cities and towns for the CTCleanEnergyOptions program for 2005 are: (1) New Haven, (2) West Hartford, (3) Middletown, (4) Hamden, (5) Manchester, (6) Fairfield, (7) Stamford, (8) Hartford, (9) Glastonbury, and (10) Milford.

Figure 1-1: Signups versus 20% by 2010 and Connecticut Clean Energy Communities by Municipality (Quarter 2, 2005)

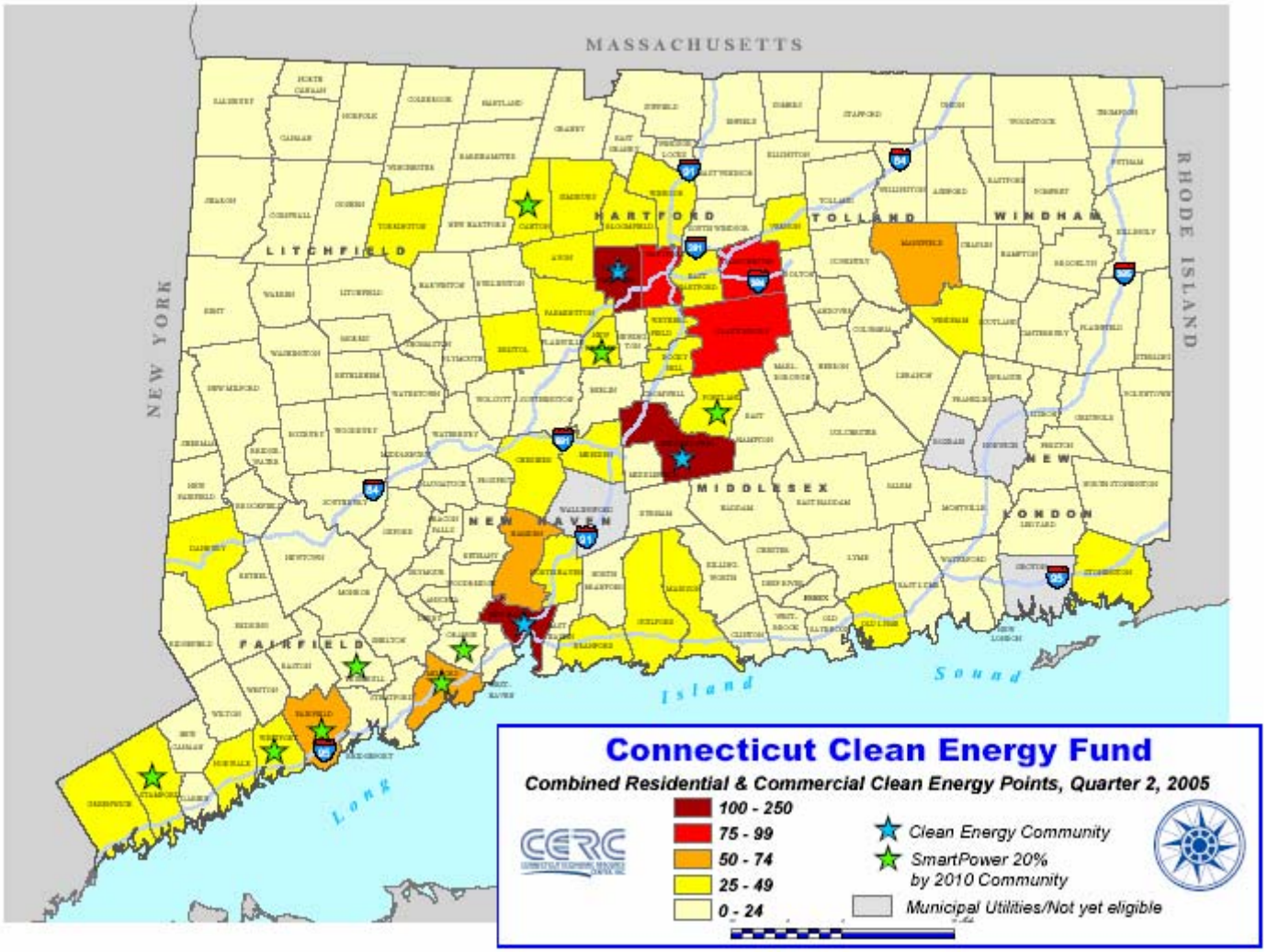


Figure 1-2: Signups versus 20% by 2010 and Connecticut Clean Energy Communities by Municipality (Quarter 3, 2005)

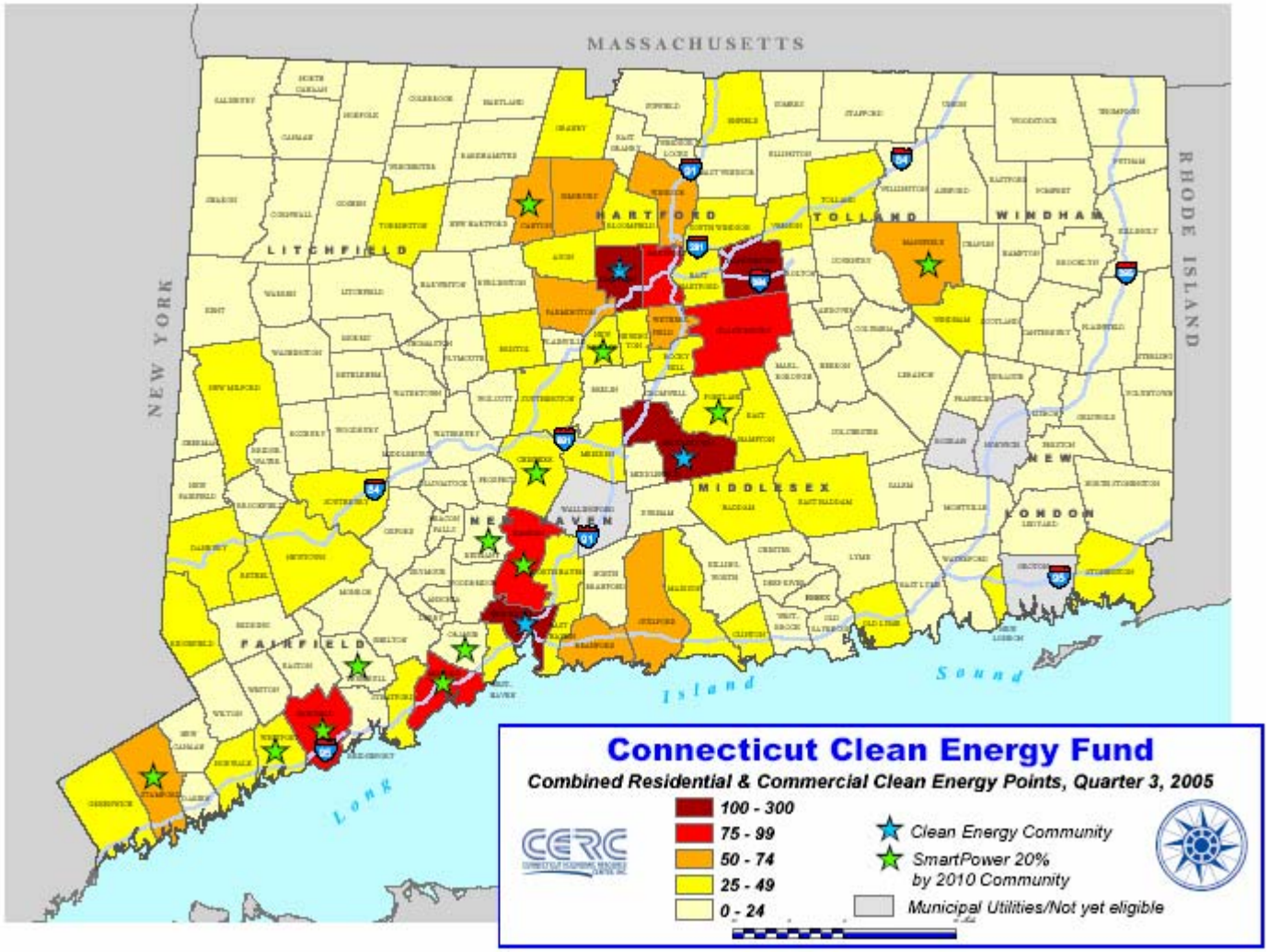
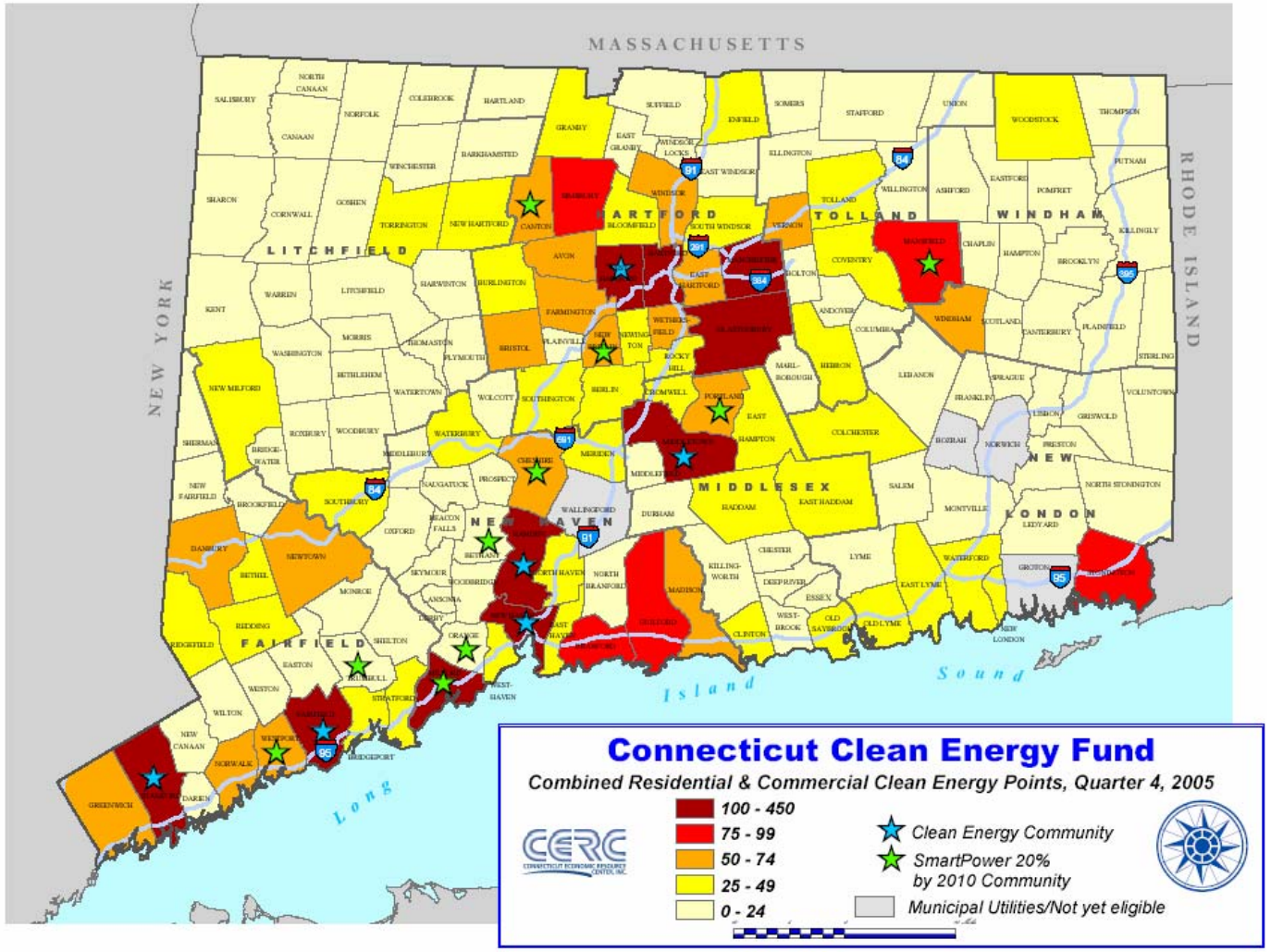


Figure 1-3: Signups versus 20% by 2010 and Connecticut Clean Energy Communities by Municipality (Quarter 4, 2005)



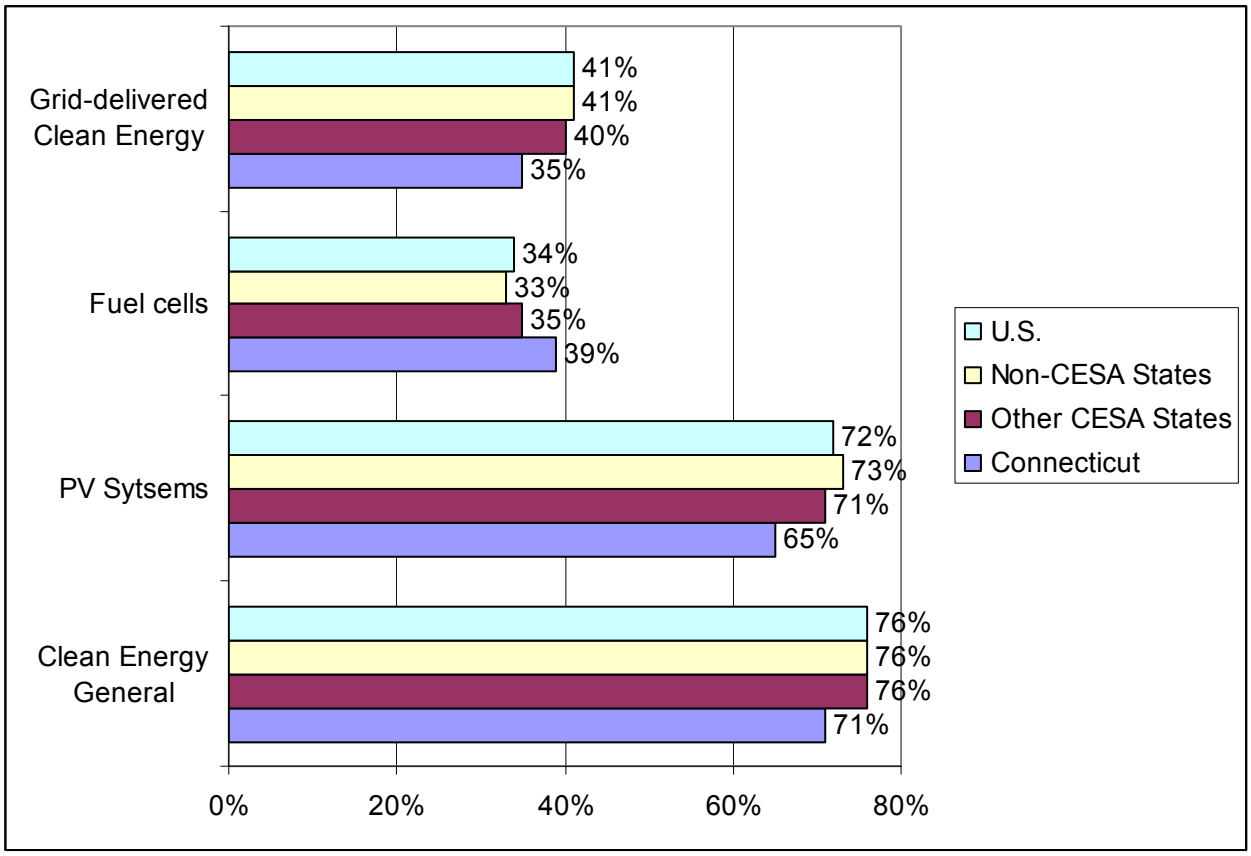
1.2 Objective 3B Summary (2005)

During 2005, CCEF began a number of programs to raise awareness and educate the public on clean energy technologies and participation opportunities. NMR conducted a baseline study prior to the launch (April 1, 2005) of the Connecticut Clean Energy Options Program to assess current levels of public awareness and knowledge of clean energy in Connecticut and across the country. Briefly, the study methodology included the following telephone surveys:

- Connecticut energy bill-payers (600 respondents)
- National survey of homeowners (943 respondents)

The Connecticut survey was longer and more detailed than the national survey, which contained a subset of key questions for comparison over time. The survey data were analyzed to compare the nation with Connecticut and Clean Energy States Alliance (CESA) states. Figure 1-4 shows some basic awareness indicators of clean energy awareness. The key conclusion from this study, prior to the launch of the Connecticut Clean Energy Options Program is that Connecticut residents are in general no more likely to be aware of clean energy than people living elsewhere in the country.

Figure 1-4: Clean Energy Awareness in Connecticut and Comparison Groups

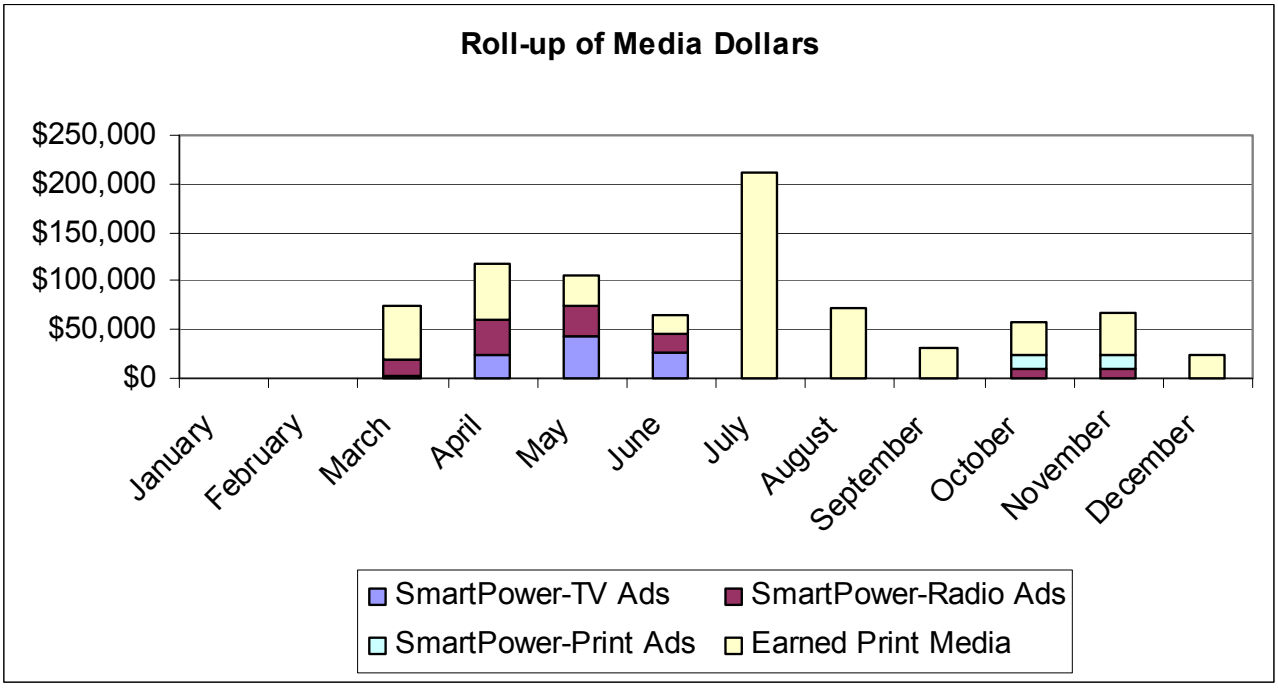


Program Goal 3B monitoring and evaluation activities also included a Media Activity Assessment, which included the following:

- Quarterly reports of indicators of media coverage and awareness-raising activities
- Data collected and tabulated on a monthly basis
- Qualitative assessment of media "buzz" (free and earned media) about clean energy in relation to CCEF programs

Media activity on CCEF programs during 2005 was sporadic, with the majority of activity, including both paid and earned media, focused around the launch of the program, followed by reasonably steady earned media coverage. Figure 1-5 shows media activity in terms of dollars, and the total value of paid advertising and earned media in 2005 was $826,782 (of which $246,687 was paid and $580,095 was earned media value). This graph is limited, however, due to the unavailability of data on some unpaid television and radio coverage of CCEF programs, and because of a spike in earned media dollar equivalents due to a Newsweek article on SmartPower featuring Connecticut on July 1, 2005.

Figure 1-5: Media Summary (2005): TV, Radio, and Print[27, 28, 29] (Cumulative Graph)



[27] Earned print media in the roll-up graph only include relevant earned or free media, or program-specific or outcome-related articles, where program-specific articles directly mention CCEF, Project 100, CT Clean Energy Communities, etc and outcome-related articles are about long-term program outcomes such as purchases of clean energy, non-purchase commitments, etc. Outcome-related articles overwhelmingly tend to mention CCEF program specifics.

[28] Source: Yankee Clipper and SmartPower

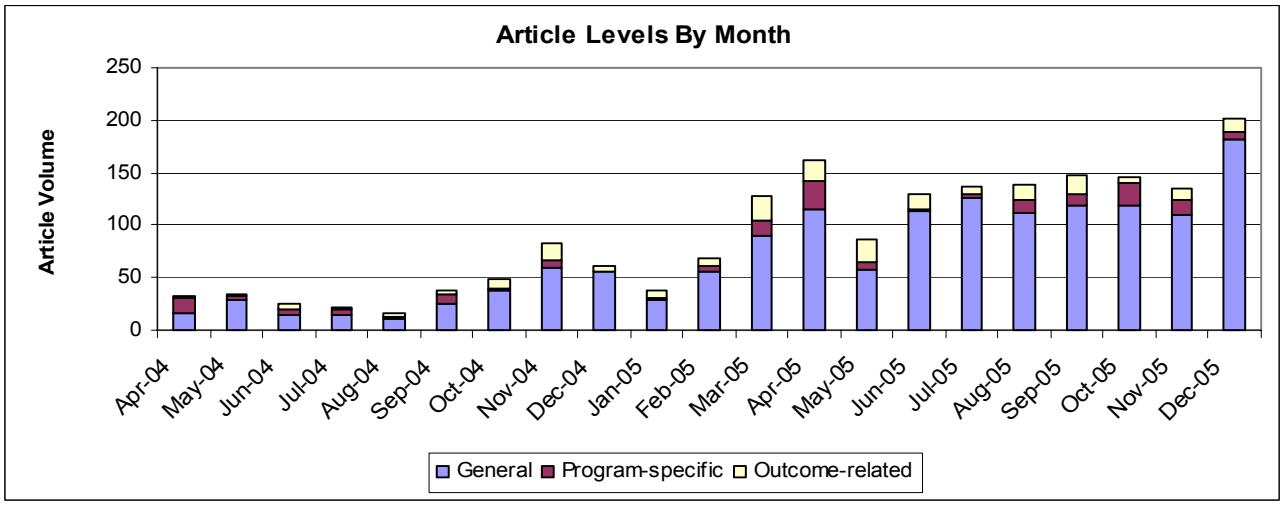
[29] The spike in July is largely due to a Newsweek article on SmartPower featuring Connecticut on July 1, 2005

Overall print media coverage of climate change and clean energy issues increased substantially throughout 2005, and has increased even more dramatically compared to coverage in 2004. Coverage of CCEF programs, however, was a limited but fairly steady part of the overall print coverage:

- Article volume shows a general upward trend over the past year (January 2005 to December 2005) with the highest total number of articles in December 2005, largely attributable to the U.N. Climate Change Conference. The peak in April 2005 is mostly due to increased attention to environmental activities surrounding Earth Day.
- The sustained high article volume over the last seven months (June 2005 to December 2005) can be partially attributed to articles framing environmentalism as a response to high oil prices and increased attention on global warming.
- Articles were evaluated according to working definitions of relevance:
  - General articles are background "noise" or articles focusing on climate change or renewable energy technologies NOT containing program information.
  - Program-specific articles directly mention CCEF, Project 100, CT Clean Energy Communities, etc.
  - Outcome-related articles are about long-term program outcomes such as purchases of clean energy, non-purchase commitments, etc. Outcome-related articles overwhelmingly tend to mention CCEF program specifics.

While general articles do not directly serve the purpose of promoting awareness of CCEF programs, it does raise general awareness about issues directly relevant to those programs. A summary graph of 2004 and 2005 print media data since April, 2004 is shown in Figure 1-6.

Figure 1-6: Print Data: Earned/Free Media[30]—Cumulative, April 2004 – December 2005[31]



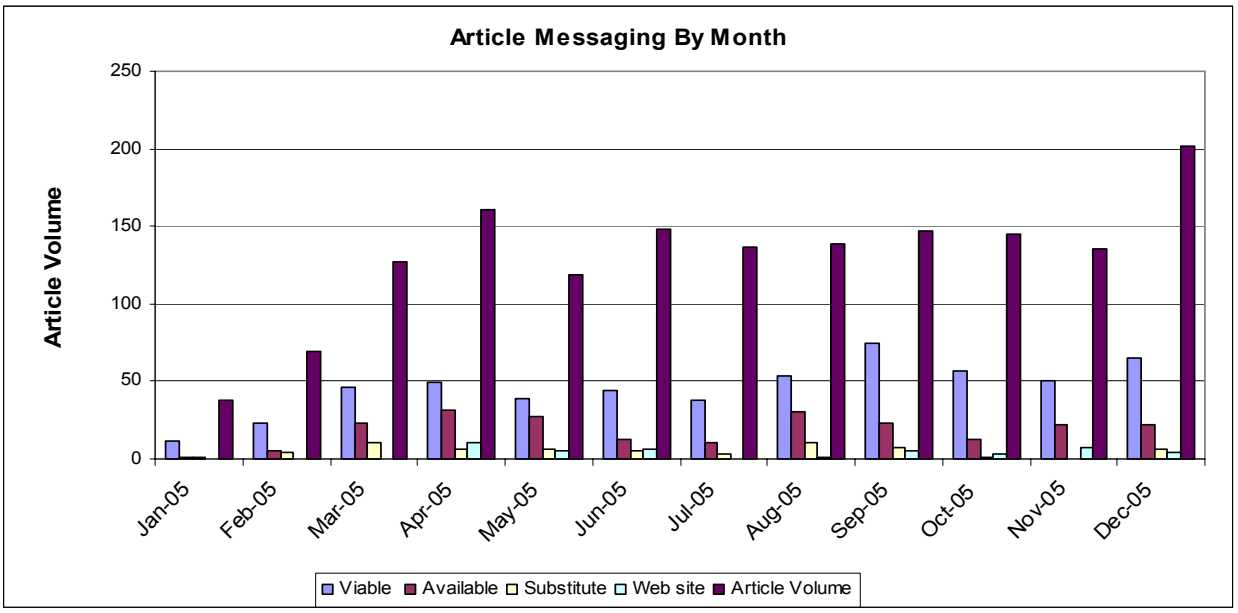
[30] Earned print media includes relevant earned or free media, or program-specific or outcome-related articles. Program-specific articles directly mention CCEF, Project 100, CT Clean Energy Communities, etc, and outcome-related articles are about long-term program outcomes such as purchases of clean energy, non-purchase commitments, etc. Outcome-related articles overwhelmingly tend to mention CCEF program specifics.

During 2005, program messaging was steady but possibly increased over the years:

- SmartPower messaging represented 36% of overall article volume in Q4—the highest quarterly total for the year—but there was a slight dip compared to the presence captured in Q3 (39%).
- Articles carrying the message of viability and availability appeared at a much greater rate than the message of substitutability or the relevant program Web sites. The message of substitutability appeared in only seven articles during Q4, marking a noticeable dip from previous months. However, inclusion of relevant program Web sites in fourteen of the articles during Q4, only surpassed by Q2, provides readers with a direct link for learning more about clean energy.
- By maintaining SmartPower messaging in one-third of all articles or more, the number of articles containing SmartPower messaging flows with overall article volume, instead of becoming buried in background noise. The messaging is becoming a more consistent part of the dialogue in Connecticut media.

A summary of program messaging in unpaid print media is presented in Figure 1-7.

Figure 1-7: Print Data: Earned/Free Media—Cumulative Messaging[32] Analysis[33]



[31] Source: Yankee Clipper
[32] Messaging based on conversation with Brian Keane (memorandum February 10, 2005). Working definitions of key messaging are as follows: Viable ("It's here"): Clean energy is a viable opportunity for CT residents, businesses, and industries; Available ("It's real"): Clean energy is more available than you think; Substitute ("It's working"): Clean energy is a perfect substitute for your existing electricity service and entails no sacrifice.
[33] Source: Yankee Clipper

2 Program Analysis

This section of the document identifies, describes, and evaluates the current portfolio of activities, expected outcomes, and external influences with regard to Program Goal 3, from the base year beginning in July of 2004 (based on the Strategic Focus document for 2004-2007) and for implementation activities currently approved and underway as of December 2005.

2.1 Outline and Sources

The basic outline of this section is as follows:

Relationship of CCEF Public Awareness, Education, and Voluntary Market Demand Initiatives to CCEF goals and objectives

- Barriers
- Specific Programs and Program Theory
  - Inputs
  - Activities
  - Outputs/Targets Reached
- Expected Program Outcomes
  - Short-term Outcomes
  - Intermediate-term Outcomes
  - Long-term Outcomes
- External Influences

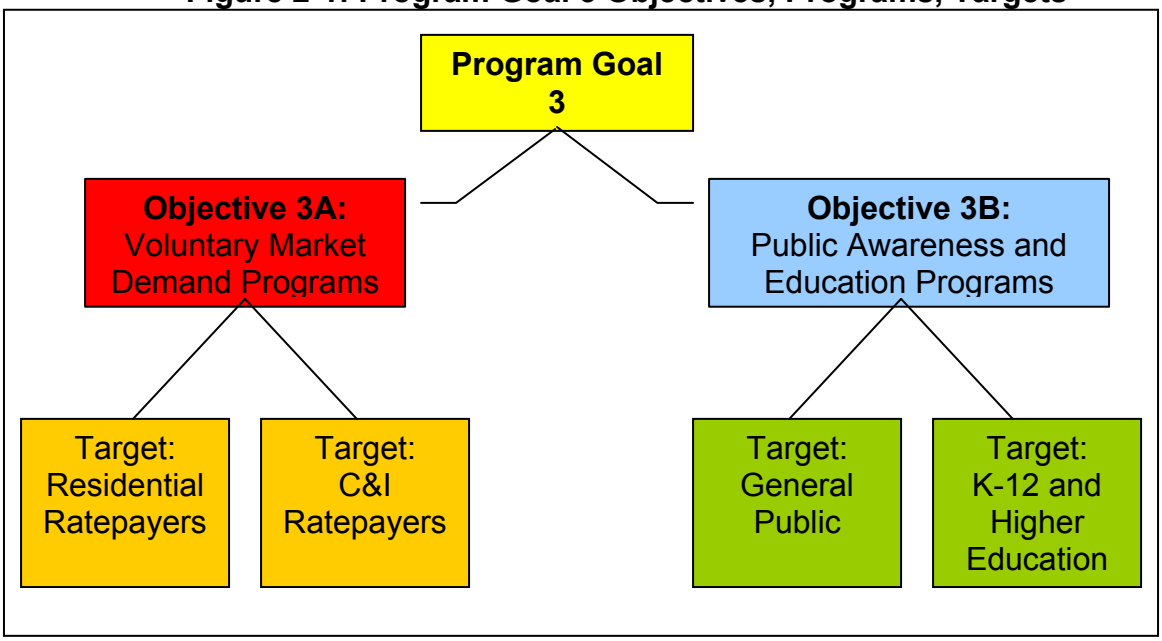
Sources for this section include:

- Program Logic Documents supplied by CCEF
- Other program materials such as the Strategic Focus (2004-2007), Summary sheets, Web site, etc.
- Numerous correspondences, discussions and interviews with program staff and strategic partners
- Analytical assumptions and conclusions

2.2 Relationship of CCEF Public Awareness, Education, and Voluntary Market Demand Initiatives to Program Goal 3 and both Objectives

Under Program Goal 3, each of the two objectives is functionally implemented by two groups of programs. As shown in Figure 2-1, the Voluntary Market Demand Programs target Residential and C&I ratepayers, while the Public Awareness and Education Programs target the general public, K-12, and higher education institutions. Specific programs supporting each objective will be discussed in Section 2.5 (Current Implementation Activities), although as of December 2005 several informal education programs are funded and under development in support K-12 and higher education institutions, but not yet active.

Figure 2-1: Program Goal 3 Objectives, Programs, Targets



2.3 Barriers Addressed through CCEF Program Goal 3

Clean energy markets in Connecticut are in their early stages of development. Legislative, regulatory, and program elements have been put in place to support such markets. The goal of having an increasing share of electricity consumed and produced in the state coming from clean energy sources, however, will only be met once a range of barriers affecting both consumers and clean energy providers are gradually overcome. The barriers that CCEF is addressing in Program Goal 3 are embedded in CCEF's operational mission statement, with the key words being "sustainable" to qualify the market conditions for clean energy, and for the "benefit" of Connecticut's ratepayers. The more obvious barriers the program is addressing include the following:

- *Cost*: Ratepayers are generally unwilling to pay the premium (incremental) cost of clean energy over direct grid power from CL&P or UI, and the price premium is tied to rates in CL&P and UI territory. This may be even more critical with the recent average increase of 22.4% in CL&P's retail rates (January 2006).
- *Public Awareness*: Market development and progress is hindered by ratepayers' incorrect perceptions (or inadequate knowledge) of clean energy products, including the following:
  - Customers lack awareness of this relatively new opportunity and of the program's sponsors (CT state legislature and DPUC), which could lend credibility to the program.
  - Customers do not understand the developing market differentiation by generation source—which is an abstraction—in comparison to attributes such as service and quality.
  - Customers are also unaware of any associated certification standards (e.g., Green-e, ERT, CT Class I or II or III) to ensure they are getting the product attributes they desire. The presence of several certification standards only adds to the uncertainty and confusion.
- *Credibility*: The electricity delivery industry is generally accepted as a natural monopoly, and expectations for electricity delivery are consistently high:
  - Clean energy is not perceived as a viable alternative because customers are risk-averse, and are unwilling to switch electric power providers and give up what they already have in terms of service, expectations, and quality.
  - The supply of clean energy is not believed to be sufficient to meet everyday energy needs, and is therefore not a perfect substitute for traditional electricity product offerings, requiring some sacrifice by the consumer.
  - Some customers may hesitate to participate based on their experience with the previous green power program which ended abruptly in 2003.
- *Value Deficit*: This barrier affects residential and C&I customers differently:
  - C&I customers, in particular, do not recognize any value that clean energy purchasing might add to their bottom line in terms of public and community relations.
  - Residential customers do not believe that they can actually realize the environmental and societal benefits of their individual decision to purchase clean energy.
- *Marketing Deficit*: Based on recent history, marketing and public awareness activities for clean energy products to Connecticut customers is not sufficient, mainly because the

clean energy marketing sector has not yet built a critical mass of customers to support an adequate level of ongoing marketing investments.

- *Institutionalized Learning*: Potential clean energy consumers learn about and understand the status quo role of energy in society through institutions (K-12 schools, higher education, community/civic groups, religious institutions) that do not also communicate messages on the environmental consequences of their power purchase selections and the benefits of clean energy purchasing.

The barriers addressed by Program Goal 3 are indirectly related to barriers addressed by Program Goals 1 and 2, which focus on developing the supply and infrastructure for clean energy in Connecticut. Barriers addressed by Program Goals 1 and 2 include meeting the Renewable Portfolio Standard (RPS), installing onsite clean energy generation, developing the nascent clean energy industry in Connecticut, and addressing the transactional barriers associated with RECs from onsite clean energy generation.

The barriers identified in this section are by no means a complete list of barriers. Clearly, many of the barriers listed above are interrelated; many other unknown barriers probably exist; and countless other minor barriers cannot fully be explored within the scope of this document. At the same time, the barriers characterized in this section represent the major barriers addressed by the program design. Based on the experience of longer running clean energy purchasing programs, satisfactory resolution of many barriers addressed by CCEF, by themselves, may not be sufficient to move the market appreciably in the near future.[34, 35]

[34] Farhar, B., 1999. Willingness to Pay for Electricity from Renewable Resources: A Review of Utility Market Research, NREL/TP-550-26148. Golden, CO: National Renewable Energy Laboratory, July. http://www.eere.energy.gov/greenpower/farhar_26148.html.

[35] Bird, Lori and Elizabeth Brown, National Renewable Energy Laboratory (NREL), Trends in Utility Green Pricing Programs (2004). Technical Report, NREL/TP-620-38800, October 2005.

2.4 Comparative Program Practices

This section is a comparative program analysis that identifies practices of leading clean energy programs elsewhere in the country in order to help inform the Connecticut Clean Energy Fund's implementation of its programs in the following ways:

- To identify frequently mentioned program practices that are innovative and replicable, as well as pitfalls to avoid
- To compare CCEF's practices and regulatory environment to other programs that have been successful
- To identify possible opportunities for successful implementation into the future

This Comparative Program Practices Assessment uses information from the Clean Energy States' Alliance (CESA) members and federal programs sponsored by the National Renewable Energy Laboratory and the U.S. Environmental Protection Agency. The types of information used for this section include the following:

- Secondary sources, including program documents and evaluation reports
- Internet research on marketing techniques and on-line tools
- In-depth interviews with program implementers

Table 2-1 lists the programs and sources consulted for the analysis.

Table 2-1: Sources for Comparative Practices Assessment

Program	Initiatives			Data Source		
	Voluntary Markets	Public Awareness	K-12 Education	Program Web Site	Secondary Reports	Interview
Massachusetts Trust Collaborative	√	√	√		√	√
Rhode Island Renewable Energy Fund	√	√				√
Sustainable Development Fund (PA)	√	√			√	√
Green Choice (Long Island Power Authority)	√	√	√	√		√
Wisconsin Focus on Energy		√	√	√		√
Energy Trust of Oregon		√			√	√
3Phases Energy (Oregon)	√				√	√
Clean Energy States Alliance	√	√		√	√	√
National Renewable Energy Laboratory	√		√	√	√	√
EPA Green Power Partnerships	√			√	√	√

2.4.1 Assessment of Comparable Programs

As one key document claims, there is no such thing as a best practice:

> *The renewable energy market is a diverse and complex one, with a variety of technologies and applications vying for market share. These diverse technologies and markets have driven states to design an equally diverse and targeted set of incentive programs. Moreover, even among the policy approaches used to target individual technologies and applications, frequently no single program stands out as optimal. This suggests that multiple program designs, careful use of professional judgment, and a willingness to experiment with a variety of program options will be keys to the success of a renewable energy fund.*[36]

After reviewing a variety of sources and consulting a number of program representatives, a number of comparative program practices stand out. This section lists those practices that are applicable to Program Goal 3. Additionally, the practices listed below are structured as follows:

- Organizational Structure and Program Design
- Developing Voluntary Market Demand for Clean Energy
- Raising Public Awareness
- Implementing School-based Public Education of Clean Energy

Many of these practices are directly under the control of CCEF; others are embedded in the statutory and/or regulatory structure of the ATSO program itself, in which CCEF may or may not have had any input. The statutory and/or regulatory environment in which the CCEF operates is important to specify,

Organizational Structure and Program Design

These practices are listed for their general application to Program Goal 3, but may also extend to other CCEF Program Goals.

- **Organizational independence**. Given the industry-wide dependence on external funding, the organization should be reasonably free of entanglements that would reduce its ability to flexibly adapt to market conditions or valuable opportunities. Attributes of a sufficiently independent organization include the following:
  - *Market-driven investment approach,*
  - *Ability to avoid the politicization of funding decisions, and*
  - *Capacity to raise additional capital.*[37]
- **Institutionalized use of program evaluation.** Wisconsin's Focus on Energy program is cited as a good example of the use of evaluation for program improvement, strategic

[36] Wiser, Ryan, Mark Bolinger, Lewis Milford, Kevin Porter, Roger Clark of the Clean Energy Group: "Innovative Practices in Renewable Energy: A Review of Domestic and International Experiences." Summarized Version from the Full Report Prepared for The Energy Trust of Oregon, July 3, 2002.
[37] Ibid.

planning, and accountability purposes.[38] Institutionalized use of program evaluation includes dedicated resources toward program evaluation for every program implemented and a dedicated human resources commitment to program evaluation that is uninvolved in, and independent from, actual implementation of the program. Few program managers believe program evaluation is given a high enough priority.

- **Internal and comprehensive goal setting**. Mission, objectives, and goal setting is usually underemphasized and should not be. Moreover, programmatic design should be driven by stated objectives and goals. Several studies and program managers express support for internal goal setting, although few program managers actually admit to implementing such a design-driven system based on stated program goals and objectives.

Developing Voluntary Market Demand for Clean Energy

For meeting Program Objective 3A, secondary research and program manager interviews suggest that the following practices are applicable, at least in part, to current or planned CCEF voluntary market demand implementation activities.

- Focus marketing on large consumers (C&I market, including municipal governments).
  - The C&I market is larger than the residential market and should attract and sustain the infrastructure for capacity development and clean energy marketer investments.
  - In theory, a strong C&I market base should drive the development of the clean energy supply and marketing infrastructure, ultimately driving residential market participation.
- Long-term view by implementing entities and persistent efforts can pay off.
  - Utilities and government agencies build confidence, develop coordination efficiencies, and institutionalize clean energy programs and partnerships through the shared experience of implementing the clean energy program over time.
  - Local stakeholders build relationships with clean energy marketers and state government agencies, helping to market and educate potential customers.
  - Structuring and executing long-term commitments helps clean energy power developers understand and hedge risk on their capacity development projects.
  - While the Clean Energy Options Program allows ratepayers to purchase clean energy from a pool of REC marketers regardless of utility service territory, some program managers in other states expressed support for exclusive REC marketer and utility partnerships to encourage long-term investment by clean energy marketers in developing local clean energy capacity and marketing infrastructure.
- Keep product offerings simple.
  - Views on the optimal number of products varied, but product offerings should not exceed three.
  - Some scalability in products (block product, 50%/100%) is desirable, allowing supporters to make a larger contribution.

[38] Wiser, Ryan, Mark Bolinger, Lewis Milford, and Roger Clark, The Clean Energy Group, and Kevin Porter, Exeter Associates, Inc.: "Innovation, Renewable Energy, and State Investment: Case Studies of Leading Clean Energy Funds," September 2002. http://eetd.lbl.gov/EA/EMP/

- Keep the marketer pool relatively small.
  - Two or three marketers is cited as the maximum for management, coordination, and customer communication reasons.
  - With small pool, clean energy marketers can understand and manage their risk and better capture their rewards.
  - A small pool also helps power developers to understand their risk and invest longer term.
- One bill for program participants is a key transactional efficiency.
- While simple product offerings assist in developing the residential market, C&I customers may need more flexible product offerings, having more diverse needs and motivations.
- If the voluntary market territory also has a RPS, a vigorous clean energy capacity development program is necessary to sustain the voluntary market.
  - Communicating such a program will maintain utility interest in participating by keeping RPS compliance costs down.
  - If supply is inadequate, the voluntary market removes RECs from the compliance market when supply is inadequate, and drives up the price for RECs.
- Municipal applications of purchasing clean energy in advance have been very successful, allowing customers to avoid rising fuel charges 10 years into the future (e.g., Austin, TX).
  - This model provides excellent long-term market information for REC marketers, municipal government planners, and the municipal utility.
  - It also hedges risks to power developers and consumers.
- Community pride/participation programs have been successful in other applications but unproven in the clean energy arena.
  - Program managers express widespread support for this approach.
  - EPA is pursuing a program through its Green Power Partnerships called Green Power Communities.
- Solar (or other clean energy) incentive/demonstration projects should be approached carefully for raising public awareness or promoting voluntary market demand.
  - Technology demonstration and incentive programs can offer visibility and raise awareness, but can fail due to lack of ownership or personal investment to maintain them over their long life-cycle.
  - Solar (and other demonstration) programs for raising public awareness of promoting voluntary market demand should still follow normal procedures for assessing technical and financial feasibility.
- Voluntary markets can be developed with or without an RPS.
  - The problem of having sufficient clean energy capacity to support proper compliance market dynamics favors having the RPS before developing the voluntary market.
  - Developing the voluntary market before implementing an RPS provides value in administrative capacity building and market knowledge development.
- Programs where marketers are directly incentivized for each signup are generally regarded as unfavorable.

- Green-e (or other such as Class I, II, etc.) certification is not significant now—but it could be in the future.
  - Branding clean energy is probably more important in the residential market than in the C&I market.
  - Consumers will want to know that their purchase will give them the value they seek.
  - The successful experience of the ENERGY STAR® brand is an instructive application of branding the energy efficiency attributes of a given product. Similarly, the successful Intel Inside® brand campaign just ended after 14 years, representing a similar application of branding an ingredient of another product.
- Offering new renewable products is a good strategy—most successful programs offer them.

Raising Public Awareness

For meeting Program Objective 3B, secondary research and program manager interviews suggest the following practices that are applicable, at least in part, to current or planned CCEF public awareness-raising implementation activities.

- Restrict funding to promotions of certificate-based products, so that the properties of the clean energy product can be clearly communicated.
- Ensure community education grants have an incentive component to the organization receiving the grant.
- State funds should coordinate and leverage advertising dollars and messaging strategies regionally.
- Coalition-based campaign development offers a variety of benefits:
  - Such campaign development practices can leverage additional funding sources and implement consistent messaging across a broader region or group of stakeholders.
  - The challenges to this approach include identifying a common set of goals and interests, reaching agreement on campaign materials, and maintaining the willingness to fund a potentially high-risk and/or low-reward effort.
  - The need for close coordination between such campaigns and marketing efforts by renewable energy suppliers has also become apparent.
- Direct marketing (e.g., Homeshows, workshops, door-to-door campaigns) should be favored over advertising efforts, but a diverse mix of activities is always advisable.
- RFP processes should be favored over other mechanisms:
  - Many competitive pressures can be leveraged to wisely spend limited public education and awareness-raising dollars.
  - Competitive processes get a variety of ideas and leverage the shared experiences of others.
  - Several program managers suggest also offering another standing unsolicited RFP mechanism to receive creative ideas from motivated providers on an ongoing basis.
- One program manager articulated the need to seek opportunities when they present themselves and take full advantage of them: "For outreach, in a small state, you need to create a critical mass to get the media buzz, and should reach for that when those conditions are right."

Implementing School-based Public Education of Clean Energy

For meeting Program Objective 3B, secondary research and program manager interviews suggest the following practices that are applicable, at least in part, to current or planned CCEF general public education and K-12 implementation activities.

- One program manager believes that an effective school-based program must include: "[An] advisory component [that] has national and local community eyes and ears, but delivers to the local community. Outreach always needs to innovate and be flexible."
  - The advisory board should be diverse, including National, State, and Local levels, and across stakeholder groups (education, business, government, and education levels).
  - State and Local level involvement is important to integrate programs into a targeted education effort.

For K-12 programs, the following specific practices are noted:

- The focus of any K-12 energy education program should be on teacher training.
  - Teachers are under enormous pressure to meet federal, state, district, and school-level curriculum standards.
  - Many K-12 teachers, especially elementary teachers, are science-phobic and need assistance.
- Ensure that investments in any curricula or workshop materials meet necessary curriculum standards and frameworks in a substantive way—especially at the state level.
- Use of pre-post tests of students, teacher evaluations, training evaluations and other feedback mechanisms is important because the number of available tools for measuring impacts from education programs is limited. Such evaluation mechanisms should be applied appropriately and sparingly, however.

For higher education programs, the following specific practices are noted:

- Like K-12 programs, the focus should be on teacher training.
- Training evaluations are the most useful mode of obtaining feedback on program impacts.
- Higher education instructors need access to deeper resources than K-12 teachers, and education programs should facilitate access to such resource centers for those higher level needs.

2.4.2 Assessment of CCEF Program Practices and Opportunities

On balance, the CCEF is following, or operating within, known practices with respect to developing a voluntary market for clean energy in Connecticut. Many of these practices are directly under the control of CCEF; many of them, however, are embedded in the statutory and/or regulatory structure of the ATSO program itself, in which CCEF may or may not have had any input into the statutory or regulatory design. Select current practices are highlighted below in the first section (*Current Practices*)—where current CCEF program practices are strongly in accordance with program practices that were advocated in the secondary research or by other program managers. The section on *Opportunitie*s notes program practices that are not emphasized sufficiently.

Current Practices

Organizationally, CCEF does have a reasonable level of independence to function according to the broad principles expressed in the secondary review of good program practices.

In order to implement Program Objective 3A (Voluntary Market Demand Initiatives), CCEF is pursuing many of the preferred program practices identified in the literature review and in the program manager interviews. Such practices and avoided pitfalls include the following:

- Marketing that focuses on large consumers (C&I and municipal consumer markets) and community pride/participation programs that have been successful in other applications. This may facilitate purchases by larger consumers.
- Avoid directly incentivizing customer signups.
- Certifying RECs by CT standards (e.g., Class I, II, etc.) is not significant now—but it could be in the future—and is generally considered a good strategy.

The statutory and regulatory authorities behind the ATSO program also provide a number of favorable conditions for the CCEF to market and implement its programs, as follows:

- Offering new renewable products is a good strategy (e.g., Class I RECs definition that includes fuel cells)—most successful programs offer them.
- Keeping product offerings simple, including a limited pool of marketers and a limited number of products.
- Providing opportunities for C&I ratepayers to negotiate alternative purchasing options.
- Having one unified electricity bill for program participants.

For implementing Program Objective 3B (Public Awareness and Education Initiatives), CCEF is also pursuing many of the preferred program practices from the literature review and program manager interviews. Such practices and avoided pitfalls include the following:

- Grants programs need an incentive component, such as the Community Innovation Grants Program.
- Direct marketing (e.g., Homeshows, workshops, door-to-door campaigns) should be balanced with advertising efforts.
- Broad use of RFP processes.
- Taking advantage of opportunities to reach a critical mass such as bi-annual bill-stuffers as supported by Connecticut Light & Power and United Illuminating.

For school-based education programs, no programs are currently up and running for comparison, but planning activities do include many of the advised program practices.

Opportunities

Clearly, no program is perfect, and numerous opportunities exist for CCEF to assert greater emphasis or review for effectiveness. The following opportunities are highlighted below:

- **Adopt and communicate a longer-term outlook.** The time horizon for developing clean energy markets is long—much longer than the current three-year planning period of

the Strategic Focus. Adding to the complexity of long-term program planning, the Clean Energy Options Program is officially set to expire in 2008. The three-year cycle can be disruptive to the nascent infrastructure and community stakeholder networks that are developing and make future implementation efforts more difficult. To the extent practical, consider extending the period of the next Strategic Focus document from three years to at least five years. In addition, incorporate into the planning process the outcomes framework (short, intermediate, and long-term) specified in the program logic model, along with realistic time horizons. Communicate this long-term outlook to community stakeholders and partners.

- **Maintain and enhance coordination activities with regional clean energy programs.** CCEF took the lead in facilitating regional clean energy program coordination by founding SmartPower, and continuously reaching out to, and sharing with, regional programs on implementation and marketing issues. This openness has facilitated considerable regional cooperation and has been a real source of strength in implementing the Program to date. While CCEF still makes relatively greater efforts than its regional partners to coordinate state funding to leverage advertising dollars and regional messaging strategies, it should continue its efforts to expand opportunities for regional coordination. New England is a regionally small but densely populated area with relatively few media markets, and consistent messaging will have more regional impact with proper coordination.
- **Focus school-based education on teacher training.** Onsite school-based education activities should focus on teacher training and working with teachers who seek to learn about clean energy. Teachers in the K-5 segment are especially deficient in science expertise; and science topics in general need to be hands-on, inquiry-based, and properly grounded in the state's pedagogical standards. Moreover, topics such as clean energy require experiments and consumables that are not standard school-provided resources. The pace of implementation will be slow when focusing on teachers; however, the focus on teacher training will also increase the likelihood that children will be impacted by the programs—an important concern when considering the direct energy benefits of the program will not be realized for many years, and are not practically measurable.
- **Emphasize the long-term vision for solar incentives through Program Goal 3.** CCEF should ensure that solar incentive and demonstration projects through Program Goal 3 (e.g., Connecticut Clean Energy Communities Program) are installed based on their lifetime viability. Solar panels last a long time (warranties exceed 20 years) but the benefits can only be realized through regular routine servicing and maintenance of the inverters, net meters, and transformers, all of which last only a few years. Solar systems need some form of clear ownership over their lifetime. Based on conversations with other Clean Energy States Alliance (CESA) program managers, many solar incentive and demonstration programs do not firmly impart specific ownership and fail as a result. [39]
- **Consider exploring a municipal-based model for the remaining four municipalities ineligible for Connecticut Clean Energy Options.** The highly successful Austin, TX model represents a possible opportunity for CCEF to propose clean energy program opportunities with the Connecticut municipal electricity suppliers through the policy-making process. One reason for the success of the Austin, TX model is the opportunity it

[39] Pettit, Timothy, Lynn Hoefgen, Ann Clark, David Hill, and Ralph Prahl, *Solar Pioneer Program Market Progress and Evaluation Report (2002).* Submitted to the Long Island Power Authority, September 2002.

presents customers to insure themselves against long-term increases in regulated fuel charges from conventionally generated electricity use when purchasing clean energy.[40] As conventional fuel rates increase over time, clean energy prices should become more economic or close the gap regardless of the clean energy generation source. A municipal program which fixes conventional fuel rates over the term of a long-term clean energy purchase allows market mechanisms to function better than tying the price premium of clean energy to the fuel costs of electricity from conventional sources. By communicating the potential benefits and applicability of the Austin, TX model to the Department of Public Utility Control and to legislative representatives, CCEF may be able to influence the degree to which such a successful program model can be applied to the municipal electricity suppliers.

Finally, the Austin, TX model reveals how the current structure of the ATSO program could negatively impact CCEF's ability to implement programs and market clean energy. By tying the ATSO (premium) rate to the regulated utility rate (and subsequently any fluctuations in fuel charges), the switch point where clean energy prices should become more economic, or even close the gap, will never occur within the program. Consequently, CCEF's operating environment for developing the voluntary market for clean energy purchasing—at a fixed price premium—does not facilitate market mechanisms in which market prices for clean energy technologies can compete with market prices for conventional electricity generation technologies. Consequently, the CCEF will face significant challenges to implementing its programs and developing the voluntary market for clean energy as regulated electricity charges continue to rise over time.[41]

[40] Two frequently cited factors in the success of the Austin, TX program are the focus on industrial (and not residential) electricity consumers, and the provision of a fixed-price retail green power product linked to a long-term wholesale power purchase agreements.

[41] In January 2006, CL&P's electricity rates increased 22.4% on average.

2.5 Current Implementation Activities

CCEF's implementation theory relies on a variety of activities, largely administered through its partners, to develop the voluntary clean energy purchasing market today (Program Objective 3A), and to raise current awareness levels (Program Objective 3B). In addition, CCEF is making investments through partners in education activities to establish clean energy as a central element in the next generation's understanding of energy resource use. Future plans include more programs in partnership with the National Renewable Energy Laboratory (NREL) to support public and K-12 education activities. Fundamentally, CCEF's approach to addressing the barriers of Program Goal 3 has five components:

- *Facilitating clean energy purchasing through the Alternative Transitional Standard Offer (ATSO)*. Public Act 03-135 authorized the Department of Public Utility Control to establish one or more "Alternative Transitional Standard Offer" (ATSO) options, to enable customers to purchase clean energy in excess of the RPS requirements. In its rulings in Docket No. 03-07-16 the DPUC established procedures which led to the availability of several offerings of clean energy. The DPUC oversaw contractual arrangements between the state's two investor-owned utilities, CL&P and UI, and Sterling Planet and Community Energy, each of which offered 50% and 100% clean energy products to ratepayers at a price premium above the utilities' standard electric rates. The ATSO requirements include minimum marketing and signup requirements by the clean energy marketers. However, CCEF is playing a significant role in facilitating clean energy purchases from the ATSO program through its programs and initiatives.[42]
- *Support for and facilitation of community-level clean energy promotion and marketing activities*. This stratagem is designed to leverage community resources to attract a large number of clean energy purchasers, thereby opening the C&I market through municipal government participation, while challenging and empowering communities to promote clean energy purchasing to C&I and residential customers at the local level. By investing in community-level partners (NGOs, philanthropic organizations, etc.), CCEF also seeks to leverage other sources of funding. This principle of reciprocity is important in that resources are not only maximized for clean energy programs but the resources also stay in CT. These activities serve both Program Objectives 3A and 3B.
- *Stakeholder and partnership cultivation and development*. Through its support of SmartPower (a non-profit marketing campaign that is leading the effort to promote clean energy), the CCEF intends to engage communities and other strategic partners to raise public awareness in a number of ways: through traditional approaches such as advertising campaigns on TV, radio, and print; through direct marketing approaches to consumers; through door-to-door operations; and through civic, religious, and other public-interest organizations. This approach is designed to develop a groundswell of support for clean energy at a level that can most effectively stimulate a sustainable voluntary market (on the demand-side) for clean energy purchasing. These activities serve both Program Objectives 3A and 3B.
- *Public awareness activities*. CCEF, through Program Objective 3 implementation activities, works with its partners and directly sponsors activities to raise public

[42] SmartPower maintains the Connecticut Clean Energy Options Web site on behalf of the DPUC.

awareness of clean energy technologies and purchasing opportunities for clean energy consumers. Some of these activities serve both Program Objectives 3A and 3B; others primarily serve Program Goal 3B.

- *Education and school-based activities*. CCEF sponsors several activities to educate K-12 students on several topics: the role of energy in society, the climate change issue, and clean energy technologies. These educational activities are aimed at developing the future market for clean energy consumers. The focus is on informal education at this point as a supplement to current activities, including attempting to work with the use of eeSmarts™—a K-8 energy education curriculum developed through the Connecticut Energy Efficiency Fund and implemented by United Illuminating and Connecticut Light and Power. These activities support Program Objective 3B.

The current portfolio (December 2005) of CCEF Board-approved and funded implementation activities include the following:

1. **Connecticut Clean Energy Communities Program** (Program Objective 3A—Residential and Commercial Programs)
2. **SmartPower** (Program Objective 3B—Public Awareness Programs)
3. **Connecticut Clean Energy Community Innovations Grants Program** (Program Objective 3B—Public Awareness Programs)
4. **Clean Energy Trail** (Program Objective 3B—Public Awareness Programs)
5. **Connecticut Center for Science and Exploration** (Program Objective 3B—Education Programs)
6. **Connecticut Science Center Collaborative** (Program Objective 3B—Education Programs)

The remainder of this section describes and summarizes the current portfolio of implementation activities. The information below was heavily adopted, or copied nearly verbatim, from Program Logic Documents provided to NMR by CCEF. All are current as of December 31, 2005 with the exception of the Clean Energy Trail for which no Program Logic Document exists.

2.5.1 Programs and Inputs

This section describes the current portfolio of Program Goal 3 programs and inputs. Table 2-2 presents the overall program funding by Program Objective.

Table 2-2: CCEF Program Goal 3 Budget (FY 2005)[43]

	Budgeted	Approved	Variance
Objective P3A	$100,000	$100,000	-
Objective P3B	$2,535,000	$2,335,000	$200,000
Total	$2,635,000	$2,435,000	$200,000

[43] Includes administrative and overhead expenses.

Connecticut Innovations, Inc. (the administrator of the CCEF) has a board approved policy that outlines the processes and procedures for CCEF according to competitive, programmatic, and strategic investments, where:

- Competitive: Competitive selection will be required for these programs.
  - Monitoring and Evaluation Programs (Program Objectives 3A and 3B) and
  - Community Innovation Grants Program (Program Objective 3B only).
- Programmatic: Programmatic selection will be required for these programs.
  - Clean Energy Trail Program - CCEF-designed program that builds off of existing investments in installed capacity (Program Objective 3B only);
  - Climate Change Program – CCEF's continued participation in Connecticut's efforts to reduce greenhouse gas (GHG) emissions (Program Objective 3B only);
  - NREL –CCEF and NREL partnership program for Connecticut teachers and undergraduate students (Program Objective 3B only);
  - Clean Energy Communities Program – CCEF-designed program that provides incentives to qualifying cities and towns (Program Objective 3A only).
  - Connecticut Science Center Collaborative - Collaborative-designed program that provides informal education opportunities on clean energy (Program Objective 3B only);
- Strategic: These organizations were selected because of their unique qualities and qualifications while directly serving the mission of the CCEF and leveraging funds from other sources.
  - SmartPower - the CCEF has identified SmartPower as a continuing strategic partner for public awareness (Program Objectives 3A and 3B); and,
  - Connecticut Center for Science and Exploration - the CCEF has identified the Connecticut Center for Science and Exploration as a partner for education through its onsite "Clean and Efficient Energy Exhibit" currently under development.

Table 2-3 presents the planned human resource requirements for implementing Program Goal 3 until 2008.

Table 2-3: CCEF Program Goal 3 Human Resources

	Program Goal 3 Director	Program Manager	Program Associate
Voluntary Market Demand Initiative (Program Objective 3A)	70%	30%	25%
Public Awareness and Education Initiative (Program Objective 3B)	30%	70%	75%
Total Time Requirement	100%	100%	100%

At present, the Program Goal 3 Director is mostly dedicated to implementing Program Objective 3A and a Program Associate has been hired to handle the majority of duties for implementing Program Objective 3B. As of December 2005, a Program Manager has not yet been hired although authorization has been granted by the CCEF Advisory Committee.

Connecticut Clean Energy Communities Program (Program Objective 3A)[44]

Under Program Objective 3A (Voluntary Market Demand Initiatives), the only currently funded program, covering both the C&I and Residential sectors, is the Connecticut Clean Energy Communities Program. This effort, however, functionally supports Program Objective 3B as well, through its integration with SmartPower's implementation activities under Public Awareness Programs. This program is available to Connecticut cities and towns in CL&P and UI territories. Should the municipal energy cooperatives (serving the remaining Connecticut residents) devise a clean energy product offering (i.e. ATSO) for their customers, then those four towns can be eligible to participate in the program. This program uses a performance-based acquisition model intended to increase residential demand for the ATSO while increasing municipal commitments to purchase clean energy. As a pilot, for "qualifying" Connecticut towns and cities in CL&P and UI territories, for every 100 ATSO sign-ups[45] that occur within their municipal boundaries[46] CCEF will provide a free 1 kW solar PV installation.

In order to qualify for a free solar PV installation, a town or city must do the following:

1. Commit to the SmartPower 20% by 2010 clean energy campaign;[47]
2. Sign up customers to the ATSO (every 100 sign-ups in a town or city qualifies for 1 kW of free solar PV system installation);[48]
3. Allocate 100% of the energy savings resulting from the installation of the free solar PV installation toward the town's or city's purchase of clean energy.

If this pilot succeeds, the program will be expanded with additional funding and will potentially include new commercial market segments (e.g. colleges and universities, school districts, etc.). By incentivizing clean energy purchasing with a solar installation, this program is indirectly supported by Program Goal 1 ("Connecticut ratepayers will have access to a diverse supply of installed clean energy resources").

Stated specific program goals, assumptions, and funding data are as follows:

- Specific Program Goals (by end of 2007)
  - The commitment of at least ten new cities and towns to the 20% by 2010 Clean Energy Campaign;
  - Up to 50 GWh of clean energy purchased by Clean Energy Community participants (e.g., municipal governments);
  - Up to 50 kW of solar PV installations at a variety of Connecticut cities and towns;

[44] Source: Adapted from the Clean Energy Communities Program Logic Document (February 1, 2005)
[45] Additional qualifying thresholds have been set to support small towns (10% of their ratepayers), or commercial customers (1 GWh of ATSO demand) that wish to support their communities clean energy efforts.
[46] Recognizing the need to reduce electricity consumption in SWCT, this program will provide qualifying towns and cities located in SWCT with 2 kW of "free" solar PV installations for every 100 ATSO sign-ups that occur within their territory.
[47] The SmartPower 20% by 2010 Clean Energy Campaign is a challenge to cities and towns, faith communities, colleges and universities, and businesses to sign up and purchase 20% of their electricity consumption from clean energy sources by 2010 (http://www.smartpower.org/20renewable_energy.htm).
[48] Other "qualifying" thresholds include the 1-GWh purchase from C&I customers and 10% of residential households. These 3 areas are the qualifying thresholds underneath this program.

  - Up to 40 GWh of voluntary clean energy purchases through the ATSO within these communities, equivalent to roughly 5,000 residential customers.
- Program Assumptions
  - This program assumes that those cities and towns that commit to the 20% by 2010 campaign will then purchase clean energy to meet their commitment;
  - This program assumes that communities will purchase RECs created within the statutory region of the Northeast (including PJM and NYISO) where there are local environmental benefits and when the cost is cheaper than New England-based RECs;
  - This program assumes an average household equivalent of 700 kWh of electricity usage per month;
  - This program assumes a $15,000 per kW installation cost for solar PV.
- Funding - $550,000 for this test pilot program

SmartPower (Program Objective 3B)[49]

Under Program Objective 3B (Public Awareness and Education Initiatives), SmartPower is currently funded as a Public Awareness Program but it functionally supports Program Goal 3A as well due to its integration with the Clean Energy Communities Program (under Voluntary Market Demand Initiatives). SmartPower is a 501(c)3 non-profit organization co-founded in late 2002 by the Connecticut Clean Energy Fund and five foundations, including the John Merck Fund, Rockefeller Brothers Fund, Pew Charitable Trusts, Emily Hall Tremaine Foundation, and Surdna Foundation. The SmartPower investment was initiated to develop marketing campaigns and programs in Connecticut with the expectation of national replication and rollout, leveraging additional dollars to grow the overall outreach program.

SmartPower's focus in Connecticut is:

1. To increase the awareness of clean energy through the "Clean Energy – Let's Make More!" media and marketing campaign;
2. To work with its collaborators to seek commitments and purchases from commercial and industrial ratepayers to support clean energy; and
3. To assist residential ratepayers in voluntarily choosing clean energy resources.

[49] Source: Adapted from the SmartPower 2006 Program Logic Document (July 1, 2005)

Stated specific program goals, assumptions, and funding data are as follows:

- Specific Program Goals
  - Raise up to $300,000 in matching contributions for Connecticut from philanthropic organizations;
  - Turn prior commitments in the 20% by 2010 Clean Energy Campaign from the State of Connecticut and municipalities into clean energy purchases – 25 GWh;
  - Achieve additional commitments to the 20% by 2010 Clean Energy Campaign for an overall target of 40 towns;
  - Increase the awareness of clean energy beyond the baseline as demonstrated by polling and improved earned media activity in communities across Connecticut.
- Program Assumptions
  - The more informed Connecticut commercial, industrial, and residential ratepayers are about the benefits of clean energy sources, the more likely they are to purchase products in support of clean energy.
- Funding (2006)
- Table 2-4 presents the planned funding for implementing SmartPower for 2006.

Table 2-4: SmartPower Program (2006)

	Objective P3A	Objective P3B	Total
Public Sector – Municipalities and State	$100,000	$50,000	$150,000
Private Sector – Small to Large Businesses		$50,000	$50,000
Other Sectors – Health and Academic		$50,000	$50,000
Constituencies – Environmental and Faith	$150,000		$150,000
Marketing – "Clean Energy – Let's Make More!" Ads		$200,000	$200,000

Connecticut Clean Energy Community Innovations Grants Program[50]

Under Program Objective 3B (Public Awareness and Education Initiatives), the Connecticut Clean Energy Community Innovations Grants Program is currently funded as a Public Awareness Program but it functionally supports Program Goal 3A as well due to its integration with the SmartPower's 20% by 2010 campaign (under Voluntary Market Demand Initiatives). This program is intended to provide small grants in amounts up to $5,000 to local clean energy task forces in 20% by 2010 towns to support local events, neighborhood awareness and purchasing campaigns, and various other innovative programs that support clean energy in communities throughout Connecticut. The main objectives are to obtain earned media and increase volunteerism at the local level to drive awareness and voluntary purchasing of clean energy.

[50] Source: Adapted from the Connecticut Clean Energy Community Innovations Small Grants Program Logic Document (December 1, 2005).

Stated specific program goals, assumptions, and funding data are as follows:

- Specific Program Goals:
  - Support the interests and needs of local Clean Energy Task Forces to promote and coordinate clean energy activities within their communities;
  - Provide support for local community-based initiatives that will identify new creative approaches towards reaching diverse segments of the population in support of clean energy;
  - Increase consumer awareness and knowledge of the benefits and availability and demand for clean energy; and
  - Increase the activity between Connecticut Innovations and the CCEF with community-based organizations throughout Connecticut.
- Program Assumptions:
  - Providing small grants to community-based organizations will directly or indirectly support CCEF's program goals and objectives.
  - Administration, disbursement, and accountability for small grants will be adequately handled by the local Clean Energy Task Forces within 20% by 2010 cities and towns. A simple turnkey process needs to be designed to make this easy, efficient, and effective.
- Eligibility Criteria:
  - This program will award seed grants to towns that have committed to the 20% by 2010 Clean Energy Campaign and have established a local clean energy task force within the town.
  - These block grants will then be made available by the respective Clean Energy Task Forces to local community-based charitable and non-profit organizations. These organizations must be officially registered 501(c)3 organizations.
- Funding (2006)
  - $200,000 will be allocated to support the block grants aspects of this test pilot program. There are to be up to 40 towns participating and a maximum of $5,000 in seed grants.[51]
  - $35,000 will be allotted for additional programmatic support including training, program design, marketing, legal, and other administrative requirements to support the successful design, development, implementation and evaluation of this program.

Clean Energy Trail[52]

Under Program Objective 3B (Public Awareness and Education Initiatives), the Clean Energy Trail is funded as a Public Awareness Program. The CCEF has been involved in the installation of a variety of clean energy technologies throughout Connecticut that are both commercial and demonstration projects. As a public awareness program the Clean Energy Trail is designed to show Connecticut residents and tourists that clean energy is real, here, and working. As of

[51] Overseen by the local Clean Energy Task Forces. Not more than $2,000 per grant can be approved and no more than one grant can be given out at any one time. Based on prior experience from NEGEF, the average grant size is expected at $1,800 for an average of 2.8 projects supported per town.

[52] Currently, there is no Program Logic Document for the Clean Energy Trail and the details cannot be itemized at this time. This program is within the scope of Program Goal 3, however, it is not under the responsibility of the Program Goal 3 director.

December, 2005, the Clean Energy Trail is not yet operational, with funding estimated at $75,000.

Connecticut Center for Science and Exploration[53]

Under Program Objective 3B (Public Awareness and Education Initiatives), the Connecticut Center for Science and Exploration (CTCSE) is funded as an Education Program. The CCEF Advisory Board and the Energy Conservation Management Board (ECMB) propose to support a 1,500 sq. ft exhibit at the Connecticut Center for Science and Exploration that focuses on the themes of clean and efficient energy sources while furthering the core science framework standards in Connecticut schools. Plans call for the exhibit to be situated at an upper-level concourse next to the global environment exhibit.

The goals of the exhibit are as follows:

- To bring attention to the science center building design itself;
- To allow visitors to create, observe, record, experiment, and understand clean energy;
- To suggest solutions to visitors who want to implement, transition, or advocate the use of clean and efficient energy; and,
- To bring attention to Connecticut's role in the production and use of clean energy and energy conservation.

Stated specific program goals, assumptions, and funding data are as follows:

- Specific Program Goals
  - Address energy as fundamental to society – it powers homes, businesses and industries;
  - Address unsustainable energy sources that are not clean, create waste, and result in environmental degradation;
  - Identify solutions for consumers to choose, and encourage the development of new power sources that have different impacts on the environment and economy;
  - Portray clean energy as beneficial to society, available and reliable – "It's Real – It's Here – and It's Working."
- Program Assumptions
  - This program assumes that the CTCSE will be the strategic partner for the CCEF's education programs; and
  - This program assumes that CL&P through the CLMF will be a joint partner and collaborator in supporting this onsite clean and energy efficient exhibit on behalf of Connecticut ratepayers.
- Funding
  - $1,000,000 will be allocated by the CCEF to support this program - $200,000 a year for 5 years. Funding will be in the form of a grant based on achieving specific deliverables and project milestones.

[53] Source: Adapted from the Connecticut Center for Science and Exploration Program Logic Document (May 1, 2005).

- This will be considered a strategic investment by the CCEF in the CTCSE because of its plan to integrate energy education into the science center building design and displays.
- CCEF funding for the onsite program is expected to be matched by $1,000,000 in funding from the CLMF.

Connecticut Science Center Collaborative[54]

Under Program Objective 3B (Public Awareness and Education Initiatives), the Connecticut Science Center Collaborative (CSCC) is funded as an Education Program. The CCEF and the Tremaine Foundation propose to support the CSCC Program as one which will focus on informal education programs on climate change impacts and possible solutions to climate change that utilize clean energy. This program will help facilitate a networking capacity among the CSCC informal education centers where information, scientific knowledge and best practices can be shared with formal educational institutions and therefore leverage public awareness on clean energy within their communities. The networking capacity will be expanded in the future with the inclusion of the Connecticut Center for Science and Exploration (CTCSE) into the "hub-and-spoke" network. This networking expansion will foster innovative ways of educating the state's residents on clean energy technologies as a solution to climate change.

Currently 30 centers, among the 60 informal education centers distributed throughout the state, are registered and participating members of the CSCC. The mission of the CSCC is as follows:

- To create a network capability among its members that will foster efforts to disseminate informal educational programs on clean energy technology as a solution to climate change;
- To sustain partnerships with research institutions such as Wesleyan and Yale University, as lively, cutting-edge resources of scientific knowledge;
- To allow visitors to create, observe, record, experiment, and understand clean energy;
- To suggest solutions to visitors who want to implement, transition, or advocate the use of clean and efficient energy; and,
- To bring attention to Connecticut's role in the production and use of clean energy and energy conservation.

The CSCC's program implementation plan is structured into three distinct phases:

- 1st Year: Identifying and testing off-the-shelf educational materials and exhibit components on clean energy technologies in ten pre-selected informal education centers throughout the state;
- 2nd Year: Evaluating the effectiveness and assessing the needs of the components tested by the centers in the previous year and prototyping exhibits and educational materials in science centers; and
- 3rd Year: Producing and disseminating educational components to at least 20 science centers.

[54] Source: Adapted from the Connecticut Science Center Collaborative Program Logic Document (October 9, 2005).

Stated specific program goals, assumptions, and funding data include the following:

- Specific Program Goals
  - Address energy as fundamental to society – it powers homes, businesses and industries;
  - Address unsustainable energy sources that are not clean, that create waste, and result in environmental degradation;
  - Draw the connection between unsustainable energy sources and climate change, as well as clean energy as a solution;
  - Portray clean energy as beneficial to society, available and reliable – "It's Real – It's Here – and It's Working."
- Program Assumptions
  - This program assumes that the Connecticut Science Center Collaborative (CSCC) will establish a strong network capability among its members to leverage informal educational programs and public awareness initiatives in clean energy;
  - This program assumes that school-based educational programs will be initiated by science centers in their local communities, as well as serve as a resource to educators throughout the state; and
  - This program assumes that the Connecticut Center for Science and Exploration (CTCSE) will be a strategic partner in fostering CSCC's goals and mission, as well as an active member of the "hub-and-spoke" network.
- Funding
  - $325,000 will be allocated to support the first two years of this program. Additional allocations will be considered for year 3 and beyond once educational materials have been tested and evaluated based on the needs of the CSCC. Funding will be in the form of a grant based on achieving specific deliverables and project milestones.

2.5.2 Outputs/Targets Reached

The program outputs illustrate how interrelated many of the programs are, including outputs that require integration of programs across both Program Goal 3 Objectives. The program outputs listed below do not constitute an exhaustive list; however, they represent key indicators for measuring program progress through the products produced from the program (the output itself), and the productivity (output per budget dollar input) of those particular programs. These metrics also form the basis for determining causality between program efforts and the intended effects—or the outcomes—and whether and to what degree CCEF's efforts actually led to the outcomes.

Key Program Objective 3A (Voluntary Market Demand Initiative) outputs include the following:

- Clean Energy Communities
  - Cities and Municipalities qualify for Clean Energy Communities
  - Cities and Municipalities commit to SmartPower's 20% by 2010 campaign
  - Door-to-Door Campaigns to target communities
  - Earned media to consumers through TV, Radio, and Print media
  - Sponsored events to consumers and/or with partners

  - Matching funds from partner organizations
- SmartPower
  - Cities and Municipalities commit to SmartPower's 20% by 2010 campaign
  - Door-to-Door Campaigns to target communities
  - Earned media to consumers through TV, Radio, and Print media
  - Sponsored events to consumers and/or with partners
  - Matching funds from partner organizations
  - Paid media to consumers through TV, Radio, and Print media
- Clean Energy Trail
  - Visitors to sites on the Clean Energy Trail
- Connecticut Center for Science and Exploration Onsite Program
  - Visitors to exhibits at science centers
- Connecticut Science Center Collaborative
  - Visitors to exhibits at science centers

Additionally, the following outputs present opportunities for potential synergies with other outputs:

- One criterion for cities and municipalities to qualify for Clean Energy Communities is they must first commit to SmartPower's 20% by 2010 campaign
- SmartPower's 20% by 2010 is supported by CCEF's support for select Door-to-Door campaigns.
- Door-to-Door campaigns represent an attractive story for local news publications and can result in some earned media coverage.
- Events are often co-sponsored by CCEF and its partners.

2.5.3 Discussion

The outputs itemized above highlight several issues:

- The current portfolio of programs relies heavily on SmartPower for realizing expected outcomes, especially when considering that a municipality must commit to SmartPower's 20% by 2010 campaign to qualify for the Clean Energy Community. In this sense, seven of nine program outputs are directly related to SmartPower's administration of CCEF funding. While such heavy dependence on SmartPower offers valuable opportunities for closely integrated approaches, the program implementation portfolio is relatively out of balance in this regard. The Community Innovations Grants Program was authorized by the CCEF Advisory Board in December 2005, and should diversify public awareness raising implementation efforts to some extent in 2006.
- With the exception of the paid media to consumers, all of the SmartPower outputs represent a first-order integration of Program Objectives 3A and 3B. This first-order integration represents the first step in the process of program efforts converging toward the common results the program wishes to achieve, further underscoring the degree to which program implementation is dependent on SmartPower's successful administration of CCEF funding.

- Residential program implementation under Program Objective 3A is largely relegated to the Clean Energy Communities Program in 2005 through a strategy that logically drives residential signups through community partnerships.
- Public Awareness and Education Programs (under Program Objective 3B) are largely focused on raising the awareness of current electricity users. Some K-12 programs that are funded, but still under development, will invest in developing future market demand for clean energy consumption by educating future electricity users (K-12 sector). These programs include the CTSCE, CSCC and working through the Connecticut Energy Efficiency Fund to include clean energy content in the eeSmarts program for K-8 students.
- Earned media is widely accepted as a more effective awareness-raising strategy than paid media, because the retention rate by citizens is higher due to the personal relevance of earned media over paid media; however, an earned media strategy does not seem to be nearly as well articulated and planned as the paid media.
- The C&I and residential PV end-user programs are *de facto* implemented under Program Goal 1; however, the disposition (e.g., retirement, sales, etc.) of the generated RECs by default fall under Program Goal 3. This complicated relationship is mirrored by the ambiguity in the current definition of Program Goal 3 which states: "The CCEF will play a significant role in…consumers actively seeking and adopting clean energy technology for their homes, businesses, and institutions." Future updates to the Strategic Focus document should clarify the role of Program 3 in consumer efforts to seek and adopt clean energy technologies and the final disposition of the RECs generated through these onsite programs.

2.6 Expected Program Outcomes

The program outcomes represent the intended effects of CCEF's programs. Although the difference between an output and an outcome, especially in the short-term, is not always clear, the outcomes listed in this section largely meet the test of being beyond the programs' direct control. In this regard, some of the outputs specified in the program logic documents have been reconfigured into the outcomes structure below.

As is the case for program outputs, the program outcomes listed below do not constitute an exhaustive list; however, they represent key indicators for measuring program progress through the programs' effectiveness (the outcomes themselves), and the cost-effectiveness (unit outcome per budget dollar input) of any given program. These metrics also articulate the logic of how program efforts ultimately lead to the long-term outcomes—or the public policy goals—that the CCEF intends to effect.

The time horizon for the outcomes listed below is based on a base year of 2004 (from the Strategic Focus 2004-2007 document).

2.6.1 Short-term Outcomes (0 to 3 Years)

The short-term outcomes are assumed to occur within the first three years of program implementation, given the current portfolio of approved program funding. This time horizon is largely based on the Program Goal 3A short-term goal to achieve 0.5% (~150 GWh) of electricity consumption in Connecticut from clean energy sources by the middle of 2007 from voluntary sources only.

The short-term outcomes resulting from the current portfolio of program activities include the following:

- Second-order integration of Program Objectives 3A and 3B
  - Open the C&I market and obtain commitments for clean energy purchases
  - Signups through CT Clean Energy Options
  - Increase in actions taken to support clean energy
  - Free media on TV, Radio, or Print about CCEF or clean energy
  - Messaging ("It's real, it's here, it's working") reaches targets
  - Customer recall of CCEF/Smart-Power advertising
  - Gain funding leverage over CCEF partners
- First-order integration of Public Awareness and Education Programs under Program Objective 3B
  - Increased understanding of the role of energy in society
  - Increased understanding of the climate change issue

The following short-term outcomes present opportunities for potential synergies with other short-term outcomes:

- Free media—or media carrying CCEF messaging without program initiation—can deliver media to channels and audiences beyond the resources of a planned media strategy. Free media is the threshold of coverage that is often referred to as "media buzz."
- Some proportion of consumers will recall CCEF/SmartPower advertising and internalize its messages ("It's real, it's here, it's working").
- Increased understanding of the role of energy in society and the climate change issue are mutually reinforcing.

2.6.2 Intermediate-term Outcomes (0 to 6 Years)

The intermediate-term outcomes are assumed to occur within the first six years (2004 to 2010) of program implementation, given the current portfolio of approved program funding. This time horizon is largely based on several goals that specify the year 2010:

- Connecticut Climate Change Action Plan 2005 – 3.0 to 4.0% of all electricity consumption in Connecticut by the end of 2010 (estimated ~900 GWh)
- Class I (7.0% by 2010), II (3% constant), and III (Energy Efficiency and Combined Heat and Power – 4.0% by 2010) RPS are considered "mandatory" demand-side market drivers
- SmartPower campaign to communities of 20% of electricity consumption from clean energy sources by 2010

The intermediate-term outcomes resulting from the current portfolio of program activities represent a complete merging of Program Objectives 3A and 3B, and all associated programs, as follows:

- Consistent delivery of municipal and C&I commitments for clean energy purchasing
- Significant increase in consumption (kWh) of clean energy
- Significant increase in number of customers signing up for clean energy
- Significant increase in awareness and knowledge of CCEF specific fund activities ("Viability")
- Significant increase in knowledge about how and where to purchase clean energy ("Availability")
- Significant increase in awareness and knowledge of clean energy and specific technologies ("Substitutability")
- Increased likelihood to purchase clean energy at prevailing prices
- Improved perceptions of benefits and personal relevance of clean energy
- Significant increase in advertising and promotion by partners and marketers

The following intermediate-term outcomes present opportunities for potential synergies with other intermediate-term outcomes:

- Consumption of clean energy (in terms of kWh) is significantly increased when the following intermediate-term outcomes are realized:
  - When municipal and C&I commitments[55] consistently deliver on clean energy purchasing
  - When the number of customers signing up for clean energy significantly increases
  - When SmartPower's messaging reaches its targets, resulting in significant increases in awareness and knowledge of CCEF-specific activities, about how and where to purchase clean energy, and about clean energy and specific technologies
- SmartPower messaging ("It's real, it's here, it's working") as currently delivered is mutually reinforcing. Improved perceptions of the benefits and a personal relevance of clean energy assist in increasing the likelihood of consumers to purchase clean energy at prevailing price levels

2.6.3 Long-term Outcomes (6+ Years)

The long-term outcomes are assumed to logically occur after the intermediate-term outcomes are realized:

- Reduced greenhouse gases globally due to Connecticut clean energy consumption
- Reduced regulated air pollution in the region due to Connecticut clean energy consumption
- Increase in energy security co-benefits
- Increase in economic co-benefits
- Clean energy marketing profitable without CCEF support
- Market transformation to sustain clean energy demand

The long-term outcomes specified above represent the long-term public policy goals that drive the CCEF's mission and the long-term merging of the three Program Goals.

2.6.4 Discussion

An analysis of the specified outcomes above reveals several overarching issues related to Program Goal 3:

- Variation in the structure of specific targets by Program Objectives:
  - Program Objective 3A supports a specific quantitative goal of .5% of kWh consumption from clean energy sources by the middle of 2007
  - Program Objective 3B declares a different approach, by supporting a qualitative goal ("…significant increase…") without a time horizon, essentially deferring the goal development and definition to stakeholders and programmatic staff.[56]

[55] C&I customers can purchase through the ATSO or negotiate a separate purchasing agreement with REC marketers, and may do so without participating in the Clean Energy Communities program..

[56] Through this document, tools are being designed to articulate the program logic for how programs will achieve a significant increase and to identify specific metrics for measuring any changes in public awareness over time.

- Neither Program Objective 3A nor Objective 3B claim explicit ownership of what it is intended to achieve, although ownership is implied. Therefore, any intended attribution of achieved or unmet Program Objectives to CCEF initiatives is ambiguous as stated in the *Strategic Focus*. In other words, whether the intended targets are an overall goal realized for all Connecticut residents regardless of causation (e.g., REC marketers, DPUC marketing, external factors) or exclusively targets achieved by CCEF program activities alone could be stated more clearly.[57, 58]
- The time-horizons for the stated program outcomes—especially the intermediate and long-term outcomes—may be unrealistically aggressive. The time-horizons of the outcome structure (Short-term Outcomes 0-3 Years; Intermediate-term Outcomes 0-6 Years; Long-term Outcomes 6+ Years) were assumed based on the need to coincide with various stated program targets. Numerous studies show the potential for developing the clean energy market in Connecticut and the receptivity of its citizens to clean energy messaging.[59, 60] In 2004, however, clean energy purchasing programs across the nation experienced relatively slower growth than years past—which was already at a modest growth rate—and even the longest running programs have not realized some of the outcomes (e.g., purchasing activity, capacity development, etc.) expected within these time frames.[61, 62]

[57] The 2006 draft Connecticut Energy Advisory Board ("CEAB") plan, however, does endorse implementation of the CCEF plan for renewable energy development.
[58] In its contract with the CCEF, NMR intends to explore and measure to what extent clean energy purchasing in Connecticut can be attributed to the activities and programs of the CCEF.
[59] Hoefgen, Lynn, Tom Mauldin, Tim Pettit (NMR), and Bryan Garcia (Connecticut Innovations). Comparative Assessment of Consumer Awareness for Clean Energy in Connecticut and the United States (Final Report), submitted to the Connecticut Clean Energy Fund, May 18, 2005.
[60] Clean Energy Market Assessment of Southern New England: Final Report. Booz-Allen & Hamilton, June 25, 2001.
[61] Farhar, B., 1999. Willingness to Pay for Electricity from Renewable Resources: A Review of Utility Market Research, NREL/TP-550-26148. Golden, CO: National Renewable Energy Laboratory, July. http://www.eere.energy.gov/greenpower/farhar_26148.html.
[62] Bird, Lori and Elizabeth Brown, National Renewable Energy Laboratory (NREL), Trends in Utility Green Pricing Programs (2004). Technical Report, NREL/TP-620-38800, October 2005.

2.7 External Influences

A number of external influences beyond the control of the program have significant potential to impact the voluntary market for clean energy purchasing and awareness of clean energy issues.

Probably the most significant external influence on the market for clean energy in Connecticut is the presence of a vibrant regional market for clean energy in the Northeastern United States. The most significant factor driving demand for clean energy is and will be widespread use of renewable portfolio standard (RPS) mechanisms.[63] With an RPS, the market infrastructure (REC marketers, marketing channels, utility participation, grass roots organizations, etc.) will develop and mature based on the reduction of long-term risks associated with developing the clean energy supply. Widespread regional implementation of an RPS mechanism will support many of the program elements already targeted by CCEF. The development of clean energy capacity in Connecticut will also ensure that RECs purchased through the voluntary market will not significantly deplete the supply available for regulatory compliance.

[63] *Experts Agree: Renewable Electricity Standards are a Key Driver of New Renewable Energy Development*. Union of Concerned Scientists, December 30, 2005.

The following table (Table 2-5) illustrates the current regional (Northeast and Mid-Atlantic) status of RPS and other clean energy products by state; the extent of coverage bodes well for the future of the market for clean energy in Connecticut.

Table 2-5: Status of RPS and Other Clean Energy Products in the Northeast and Mid-Atlantic

State	Market Status[64]	Voluntary Market Programs[65, 66] (No. Initiatives in Parentheses)	Voluntary Market Target[67]	RPS[68]
Maine	Retail Green Power Products	State-wide (5); Utility specific (2)-		30% by 2000
New Hampshire	Restructuring is active	NA	NA	
Vermont	Regulated/ Non-competitive	Utility Green Pricing (2)		
Massachusetts	Retail Green Power Products	Utility-specific (4); Green Pricing (1)		4% by 2009
Connecticut	Retail Green Power Products	State-wide (3)	.5% by 2007; 3% by 2010	14% by 2010[69]
Rhode Island	Retail Green Power Products	State-wide (3)		16% by 2019
New York (NYSERDA)	Retail Green Power Products	Region-wide (12)	1% by 2013[70]	24% by 2013 (NY State)
New York (LIPA)	Retail Green Power Products	Region-wide (3)		24% by 2013 (NY State)
New Jersey	Retail Green Power Products	State-wide (2); Utility specific (1)		6.5% by 2008
Pennsylvania	Retail Green Power Products	Utility-specific (4)		8% by 2020
Delaware	Retail Green Power Products	State-wide (2)		10% by 2019
Maryland	Retail Green Power Products	State-wide (2)		7.5% by 2019
District of Columbia	Retail Green Power Products	State-wide (2)		11% by 2022
Virginia	Retail Green Power Products	State-wide (2)		

[64] Bird, Lori and Blair Sweeey, National Renewable Energy Laboratory (NREL), *Green Power Marketing in the United States: A Status Report (Eighth Edition)*, Technical Report, NREL/TP-620-38994, October 2005.
[65] Ibid.
[66] www.gocleanenergy.com, December 30, 2005.
[67] The actual number of programs with specific voluntary clean energy purchasing goals is not known. NMR only discovered one other program with such a goal.
[68] *Renewable Electricity Standards at Work in the States: Fact Sheet*. Union of Concerned Scientists, December 30, 2005.
[69] Class I – 7%, Class II – 3%, and Class III – 4%.
[70] Grace, Robert with contributors Ed Holt and Ryan Wiser. "RPS Design Options to Support New York's Voluntary Market for New Renewable Energy (Green Market)," NY RPS Design Workshop, Albany, New York, June 9, 2005.

Other potential external influences include the following:

- The rate of development of clean energy capacity in Connecticut and throughout New England to keep prices for Class I RECs in Connecticut competitive relative to elsewhere in New England;
- Continued legislative support for clean energy in Connecticut;
- The emergence of a carbon credit systems such as the Regional Greenhouse Gas Initiative (RGGI);
- Environmental impacts;
- Local opposition to the development of clean energy power generation projects (the NIMBY or "Not in my back yard" syndrome);
- Institutional barriers to installation of clean energy technologies (e.g., knowledge of PV systems and new PV products by local officials and decision makers);
- Electricity prices from traditional power generation sources;
- Reluctance by financial markets to invest in merchant power plants and energy development in general, especially since the Enron scandal and, more locally, the collapse of the merchant plant market in the period following electric industry restructuring, and the lack of long term power purchase agreements for merchant power;
- Technological advances in conventional energy generation technologies;
- Technological advances in clean energy generation technologies;
- The maturation process of a competitive electricity market;
- Federal support for clean energy production (e.g., the Production Tax Credit program);
- ATSO rules and policies (market participants design rules); and
- Climate and geopolitical events (hurricanes in the Gulf of Mexico, terrorist attacks, regional blackouts, etc.).

3 Monitoring and Evaluation Plan

This section of this document identifies, describes, and evaluates indicators to measure the performance of the current portfolio of CCEF activities, including program outputs and expected outcomes with regard to Program Goal 3, from the base year beginning July 2004 (based on the Strategic Objectives document for 2004-2007), and for implementation activities currently approved and underway as of December of 2005.

3.1 Outline and Sources

The basic outline of this section is as follows:

1. The Program Logic Model is described and illustrated in graphic form.
2. The performance indicators and metrics are specified as follows:
    a. Program Outputs
    b. Short-term Outcomes (0-3 Years)
    c. Intermediate-term Outcomes (0-6 Years)
    d. Long-term Outcomes (6+ Years)

Sources for this section include:

- Program Logic Documents supplied by CCEF
- Other program materials such as the Strategic Focus (2004-2007), Summary sheets, Web site, etc.
- Numerous correspondences, discussions and interviews with program staff and strategic partners
- Analytical assumptions and conclusions

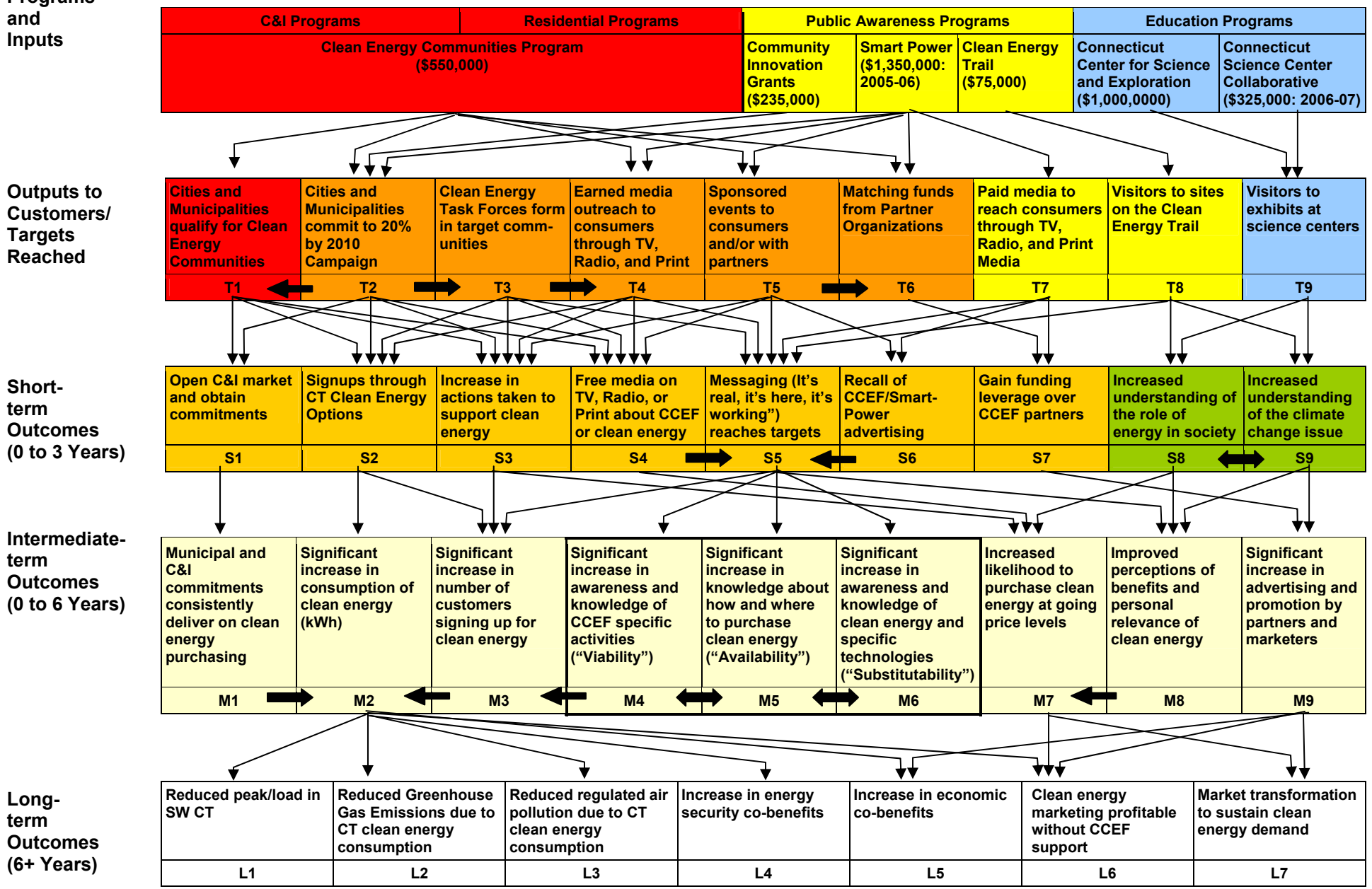
3.2 Program Logic Model

A program logic model is an evaluation and a program planning tool, expressed in graphic form, used to summarize the interrelationships among evaluation activities, expressed in terms of a logical progression of performance indicators. Unlike an organizational process model or flow chart, which centers on program activities and implementation processes, the Program Logic Model is not intended to be an exhaustive view of the system it represents. The Program Logic Model is a shadow of the program itself as an expression of the selected performance metrics and of the indicators, in hierarchical form, of the monitoring and evaluation plan. In summary, the proposed metrics are indicators of performance, but not necessarily the definitive story, and the logic model provides some context for the indicators specified. As additional initiatives are approved and funded, they will be integrated into the program logic model below and appropriate metrics and indicators will be identified and developed as well.

The following graphic (Figure 3-1) illustrates the program logic of CCEF Program Objective 3, developed by NMR, at a relatively high level. Additional metrics are specified in tabular format in the pages following the attached model.

Figure 3-1: CCEF Program Goal 3 Logic Model

(Base Year for Outcomes is July 2004; Implementation Current as of December 2005)



The following key (Table 3-1) further describes the detail of the Program Logic Model.

Table 3-1: Program Logic Model Key

Element	Description
	Program Objective 3A activities (Both C&I and Residential)
	Program Objective 3B activities (Public Awareness Programs)
	Program Objective 3B activities (Education Programs)
	First order integration of Program Objectives 3A and 3B, representing step in the process toward converging outcomes over time
	Second order integration of Program Objectives 3A and 3B, representing step in the process toward converging outcomes over time
	First order integration of Program 3B activities (Public Awareness and Education), representing step in the process toward converging outcomes over time
	Uniform integration of Program Goal 3 Objectives
➡	Direct relationship, where program element directly interacts with, and is completely dependent on, adjoining program element
⬌	Synergistic interaction

3.3 Performance Indicators and Measurement Plan

The following tables detail proposed indicators, metrics, and monitoring activities for evaluation elements of the Program Logic Model under Program Goal 3. The program performance indicators presented in the following tables do not represent the universe of indicators for measuring program performance. NMR intends to collect additional data and develop additional indicators of program performance. Depending on the evaluation objectives, other indicators may include productivity metrics, cost-effectiveness metrics, statistical tests of correlation, etc. The indicators listed in this section would represent a substantial body of data and information, however, for developing additional indicators as needed.

Monitoring activities are also specified by frequency of measurement, data source, and data collection method. Finally, the evaluation elements in the Program Logic Model are also tested for their logical relationships by describing the following:

- How a given evaluation element relates to the previous evaluation element(s).
- Why a given evaluation element relates to the following evaluation element(s).

Finally, the table itemizes any potential synergies among the program elements, and whether the interrelationships are partial or direct.

3.3.1 Program Outputs

The program outputs for the current portfolio of CCEF programs are described in the document entitled: "Program Analysis of the Connecticut Clean Energy Fund's Public Awareness, Education, and Voluntary Market Demand Initiatives." The performance indicators for program outputs are itemized in Table 3-2 below, and the shorthand identifier for the proposed series of Program Output metrics is the letter "T."

Table 3-2: Performance Indicators of Program Outputs

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	Program(s)	Why it relates to Short-term Outcomes (0-3 years)	Synergies and Interactions
Cities and Municipalities qualify to Clean Energy Communities	T1	Number of commitments	Variable, based on progress	Program tracking	CCEF	CEC	Opens C&I market and obtains commitments; Obtains signups through CT Clean Energy Options; Increases actions taken to support clean energy; Increases free media about CCEF or clean energy	
Cities and Municipalities commit to 20% by 2010 campaign	T2	Number of commitments	Variable, based on progress	SmartPower campaign tracking	SmartPower	SmartPower/CEC	Opens C&I market and obtains commitments; Obtains signups through CT Clean Energy Options; Increases actions taken to support clean energy; Increases free media about CCEF or clean energy	Directly interacts with Cities and Municipalities committing to 20% by 2010 campaign; Directly interacts with Small Grant Campaigns to target communities
Small Grant Campaigns to target communities	T3	Meeting goal, number of partners	Variable, based on campaign	Program tracking	CCEF	SmartPower/CEC	Obtains signups through CT Clean Energy Options; Increases actions taken to support clean energy; Increases free media about CCEF or clean energy; Results in messaging reaching program targets	Directly interacts with earned media to consumers
Earned media to consumers through TV, Radio, and Print media	T4					SmartPower/CEC	Obtains signups through CT Clean Energy Options; Increases actions taken to support clean energy; Increases free media about CCEF or clean energy; Results in messaging reaching program targets	
	T4a	Articles about CCEF or clean energy	Monthly reported on a quarterly basis	Clipping service	CCEF			
	T4b	Reach of articles about CCEF or clean energy	Monthly reported on a quarterly basis	Clipping service	CCEF			

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	Program(s)	Why it relates to Short-term Outcomes (0-3 years)	Synergies and Interactions
	T4c	Advertising equivalency of articles about CCEF or clean energy	Monthly reported on a quarterly basis	Clipping service	CCEF			
Sponsored events to consumers and/or with partners	T5	Variable	Reported on a quarterly basis	Program tracking	CCEF	SmartPower/CEC	Increases actions taken to support clean energy; Increases free media about CCEF or clean energy; Results in messaging reaching program targets; Helps recall of CCEF/SmartPower advertising	Directly interacts with obtaining matching funds from partner organizations
Matching funds from partner organizations	T6	Dollars per year and number of partners	Annual	SmartPower campaign tracking; annual report	SmartPower	SmartPower/CEC	Leverages funding in partner organizations	
Paid media to consumers through TV, Radio, and Print media	T7					SmartPower	Results in messaging reaching program targets; Helps recall of CCEF/SmartPower advertising; Leverages funding in partner organizations	
	T7a	Value of paid media in dollars per month by medium	Monthly reported on a quarterly basis	Program tracking	CCEF			
	T7b	Potential audience (e.g., Impressions) of paid media in numbers by month by medium	Monthly reported on a quarterly basis	Program tracking	CCEF			
	T7c	Placement and targets of paid media spots in numbers by month by medium	Monthly reported on a quarterly basis	Program tracking	CCEF			

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	Program(s)	Why it relates to Short-term Outcomes (0-3 years)	Synergies and Interactions
Visitors to sites on the Clean Energy Trail	T8	Numbers by month	Monthly reported on a quarterly basis	Program tracking	CCEF	CET	Increases understanding of the role of energy in society; increases understanding of the climate change issue	
Visitors to exhibits at science centers	T9	Numbers by month by location	Monthly reported on a quarterly basis	Program tracking	CCEF	CCSE-Onsite/CSCC	Increases understanding of the role of energy in society; increases understanding of the climate change issue	

3.3.2 Short-term Outcomes (0-3 Years)

The short-term outcomes for the current portfolio of CCEF programs are described in the document entitled: "Program Analysis of the Connecticut Clean Energy Fund's Public Awareness, Education, and Voluntary Market Demand Initiatives." The performance indicators for the following short-term outcomes are itemized in Table 3-3 below, and the shorthand identifier for the proposed series of short-term outcome metrics is the letter "S."

Table 3-3: Performance Indicators of Short-term Outcomes (0 to 3 years)
(Base Year for Outcomes is July 2004; Implementation Current as of December 2005)

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	How it relates to these Outputs	Why it relates to these Intermediate-term Outcomes (0-10 years)	Synergies and Interactions
Open C&I market and obtain commitments	S1					Cities and Municipalities committing to CEC and the 20% by 2010 campaign attract C&I participants within city/municipality	C&I participants will follow up on commitments made to cities and municipalities	
	S1a	Diversity of commitments by business sector	Variable	CCEF, SmartPower Activity Sheets	SmartPower, CCEF			
	S1b	Number of C&I commitments	Variable	CCEF, SmartPower Activity Sheets	SmartPower, CCEF			
Signups through CT Clean Energy Options	S2					Cities and Municipalities committing to CEC, the 20% by 2010, door-to-door campaigns, and earned media to consumers result in signups to CT Clean Energy Options	Signups to CT Clean Energy Options will directly increase kWh consumption of clean energy resources, and eventually result in a significant increase in the number of participating customers.	
	S2a	Number of C&I signups	Monthly starting in 2006	ATSO Marketers	NMR team			
	S2b	Number of residential signups	Monthly starting in 2006	ATSO Marketers	NMR team			
Increase in actions taken to support clean energy	S3					Cities and Municipalities committing to CEC, the 20% by 2010, door-to-door campaigns, earned media to consumers, and sponsored events result in increased actions in support of clean energy	Actions in support of clean energy will eventually result in a significant increase in the number of participating customers and an increased likelihood to purchase clean energy at going price levels.	
	S3a	Talk with friends, relatives, co-workers, or neighbors	Quarterly starting in 2006	Consumer survey; Initiative surveys	NMR team, CCEF			
	S3b	Write letters to elected officials	Quarterly starting in 2006	Consumer survey; Initiative	NMR team, CCEF			

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	How it relates to these Outputs	Why it relates to these Intermediate-term Outcomes (0-10 years)	Synergies and Interactions
				surveys				
	S3c	Write letters to newspapers or magazines	Quarterly starting in 2006	Consumer survey; Initiative surveys	NMR team, CCEF			
	S3d	Make donations to organizations supporting clean energy	Quarterly starting in 2006	Consumer survey; Initiative surveys	NMR team, CCEF			
	S3d	Joined or formed organizations committed to clean energy	Quarterly starting in 2006	Consumer survey; Initiative surveys	NMR team, CCEF			
Free media on TV, Radio, or Print about CCEF or clean energy	S4					Cities and Municipalities committing to CEC, the 20% by 2010, door-to-door campaigns, earned media to consumers, and sponsored events result in a free media buzz about clean energy.	Free media will result in an increased likelihood to purchase energy at going price levels.	Directly interacts with messages reaching targets
	S4a	Articles about CCEF or clean energy	Monthly reported on a quarterly basis	Clipping service	CCEF			
	S4b	Reach of articles about CCEF or clean energy	Monthly reported on a quarterly basis	Clipping service	CCEF			
	S4c	Advertising equivalency of articles about CCEF or clean energy	Monthly reported on a quarterly basis	Clipping service	CCEF			

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	How it relates to these Outputs	Why it relates to these Intermediate-term Outcomes (0-10 years)	Synergies and Interactions
Messaging (It's real, it's here, it's working") reaches targets	S5	Targeted messaging of articles (earned media)	Annual starting in 2006	Program participant survey; Participant focus groups; ATSO Marketers	NMR team; ATSO marketers	Door-to-door campaigns, earned media, sponsored events, and paid media result in messaging reaching intended targets.	Messaging reaches targets resulting in significant increases in customer signups, awareness of CCEF and CCEF specific activities, knowledge about how and where to purchase clean energy, awareness and knowledge of clean energy and specific technologies, and improved perceptions of benefits and personal relevance of clean energy.	
Recall of CCEF/Smart-Power advertising	S6	Level of recall of CCEF advertising	Quarterly starting in 2006	Consumer survey; Initiative surveys	NMR team, CCEF	Sponsored events and paid media result in recall of CCEF/SmartPower advertising.		Directly interacts with messages reaching targets
Funding Leverage	S7	Partner satisfaction	Annual starting in 2006	In-depth interviews with partner organizations	NMR team, CCEF	Matching funds from partner organizations and paid media to consumers results in gaining funding leverage over partners.	Gaining funding leverage results in a significant increase in advertising and promotion by partners and marketers.	
Increased understanding of the role of energy in society	S8	Level of knowledge	Quarterly starting in 2006	Consumer survey; Initiative surveys	NMR team, CCEF	Visitors to sites on the clean energy trail and to exhibits at CCEF-sponsored science centers results in an increased understanding of the role of energy in society.	An increased understanding of the role of energy in society results in an increased likelihood to purchase clean energy at going price levels and improved perceptions of benefits and personal relevance of clean energy.	Directly interacts with increased understanding of the role of energy in society
Increased understanding of the climate change issue	S9	Level of knowledge	Quarterly starting in 2006	Consumer survey; Initiative surveys	NMR team, CCEF	Visitors to sites on the clean energy trail and to exhibits at CCEF-sponsored science centers results in an increased understanding of the climate change issue.	An increased understanding of the climate change issue results in an increased likelihood to purchase clean energy at going price levels and improved perceptions of benefits and personal relevance of clean energy.	Directly interacts with increased understanding of the climate change issue

3.3.3 Intermediate-term Outcomes (0-6 Years)

The intermediate-term outcomes for the current portfolio of CCEF programs are described in the document entitled: "Program Analysis of the Connecticut Clean Energy Fund's Public Awareness, Education, and Voluntary Market Demand Initiatives." The performance indicators for the following intermediate-term outcomes are itemized in Table 3-4 below, and the shorthand identifier for the proposed series of short-term outcome metrics is the letter "M."

Table 3-4: Performance Indicators of Intermediate-term Outcomes (0 to 6 Years)
(Base Year for Outcomes is July 2004; Implementation Current as of December 2005)

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	How it relates to these Short-term Outcomes (0-3 years)	Why it relates to these Long-term Outcomes (10+ years)	Synergies and Interactions
Municipal and C&I commitments consistently deliver on clean energy purchasing	M1					Opening the C&I market segment and obtaining commitments will result in municipal and C&I partners consistently delivery on clean energy purchasing commitments		Directly interacts with significant increases in consumption of clean energy (kWh)
	M1a	Commitments translate into signups.	Variable	Program Tracking; SmartPower Campaign Tracking	SmartPower; CCEF			
	M1b	Signups significantly exceed commitments for a given time period.	Monthly	REC Marketers; NMR team	NMR team			
Significant increase in consumption (kWh) of clean energy	M2					Signups through CT Clean Energy Options results in a significant increase in consumption (kWh) of clean energy.	Significant increase in consumption (kWh) of clean energy will result in reduced peak/load in SW CT, reduced greenhouse gas emissions due to CT clean energy consumption, reduced regulated air pollution due to CT clean energy consumption, an increase in energy security co-benefits, an increase in economic co-benefits, and conditions that make clean energy marketing profitable without CCEF support.	

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	How it relates to these Short-term Outcomes (0-3 years)	Why it relates to these Long-term Outcomes (10+ years)	Synergies and Interactions
	M2a	kWh consumption of clean energy through the "CT Clean Energy Options" program.	Monthly	REC Marketers; DPUC	NMR team			
	M2b	kWh equivalent of bilateral REC transactions	TBD	NEPOOL GIS; REC Marketers; In-depth interviews with C&I purchasers	CCEF; NMR team			
	Mc	kWh equivalent of on-site clean energy installations where RECs are retained and expired by the host by customer class (residential commercial, and industrial).	TBD	CCEF Program Tracking; NMR team	CCEF; NMR team			
Significant increase in number of customers signing up for clean energy	M3					Signups through CT Clean Energy Options, increased actions taken to support clean energy, and messaging reaching intended targets will result in a significant increase in number of customers signing up for clean energy.		Directly interacts with significant increases in consumption of clean energy (kWh)
	M3a	Sign-ups (number of customers) of clean energy through the "CT Clean Energy Options" program.	Monthly	REC Marketers; DPUC	NMR team			

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	How it relates to these Short-term Outcomes (0-3 years)	Why it relates to these Long-term Outcomes (10+ years)	Synergies and Interactions
	M3b	Bilateral REC transactions	TBD	NEPOOL GIS; REC Marketers; In-depth interviews with C&I purchasers	CCEF; NMR team			
	M3c	On-site clean energy installations where RECs are retained and expired by the host by customer class (residential commercial, and industrial).	TBD	CCEF Program Tracking; NMR team	CCEF; NMR team			
Significant increase in awareness and knowledge of CCEF specific fund activities ("Viability")	M4	Awareness and knowledge of clean energy and CCEF (knowledge of the Fund and specific fund activities)	Quarterly	Quarterly public awareness surveys	NMR team	Messaging reaching intended targets will result in a significant increase in awareness and knowledge of CCEF specific fund activities.		Directly interacts with significant increases in customer signups for clean energy and significant increases in knowledge about how and where to purchase clean energy.
Significant increase in knowledge about how and where to purchase clean energy ("Availability")	M5	Knowledge about how and where to purchase renewable energy	Quarterly	Quarterly public awareness surveys	NMR team	Messaging reaching intended targets will result in a significant increase in knowledge about how and where to purchase clean energy.		Directly interacts with significant increase in awareness and knowledge of clean energy and specific technologies and awareness and knowledge of CCEF specific fund activities.

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	How it relates to these Short-term Outcomes (0-3 years)	Why it relates to these Long-term Outcomes (10+ years)	Synergies and Interactions
Significant increase in awareness and knowledge of clean energy and specific technologies ("Substitutability")	M6	Awareness and knowledge of clean energy and specific technologies	Quarterly	Quarterly public awareness surveys	NMR team	Messaging reaching intended targets will result in a significant increase in awareness and knowledge of clean energy and specific technologies.		Directly interacts with significant increases in knowledge about how and where to purchase clean energy.
Increased likelihood to purchase clean energy at going price levels	M7					An increase in actions taken to support clean energy, free media about CCEF or clean energy, and an increased understanding of the role of energy in society will result in an increased likelihood to purchase clean energy at going price levels.	Increased likelihood to purchase clean energy at going prices levels results in conditions that make clean energy marketing profitable without CCEF support and market transformation to sustain clean energy demand.	
	M7a	Levels of likelihood to purchase	Quarterly	Quarterly public awareness surveys	NMR team			
	M7b	Diverse portfolio of purchased clean energy products	Monthly	REC Marketers; NMR team	NMR team			
Improved perceptions of benefits and personal relevance of clean energy	M8	Levels of perceived costs and personal benefits	Quarterly	Quarterly public awareness surveys	NMR team	Messaging reaching intended targets and an increased understanding of the role of energy in society will result in improved perceptions of benefits and personal relevance of clean energy.		Directly interacts with an increase in the likelihood to purchase clean energy at going price levels.
Significant increase in advertising and promotion by partners and marketers	M9					Gaining funding leverage of partner organizations and an increased understanding of the climate change issue will result in a significant increase in advertising and promotion by partners and marketers.	A significant increase in advertising and promotion by partners and marketers results in an increase in economic co-benefits, conditions that make clean energy marketing profitable without CCEF support and market transformation to sustain clean energy demand.	

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	How it relates to these Short-term Outcomes (0-3 years)	Why it relates to these Long-term Outcomes (10+ years)	Synergies and Interactions
	M9a	Dollar value of advertising and promotion by vendors and other trade allies	Annually	SmartPower campaign tracking; NMR in-depth interviews with partners	SmartPower; NMR team			
	M9b	Marketing and advertising activities by utilities and REC Marketers	Quarterly	DPUC reports; NMR in-depth interviews; secondary sources	NMR team			

3.3.4 Long-term Outcomes (6+ Years)

The long-term outcomes for the current portfolio of CCEF programs are described in the document entitled: "Program Analysis of the Connecticut Clean Energy Fund's Public Awareness, Education, and Voluntary Market Demand Initiatives." The performance indicators for the following long-term outcomes are itemized in Table 3-5 below, and the shorthand identifier for the proposed series of long-term outcome metrics is the letter "L."

Unlike the previous levels of the Program Logic Model, the specific monitoring parameters are not explained, based on the long time horizon well beyond the scope of the present evaluation team.

Table 3-5: Performance Indicators of Long-term Outcomes (6+ Years)
(Base Year for Outcomes is July 2004; Implementation Current as of December 2005)

Evaluation Element	Indicator ID	Metric or Indicator	Frequency	Data Source	Collected by	How it relates to these Intermediate-term Outcomes (0-10 years)
Reduced peak/load in SW CT	L1	Significant consumption of clean energy produced in SWCT	TBD	Program Goal 1 Tracking	TBD	Significant increase in consumption (kWh) of clean energy generated will reduce peak transmission electricity loads
Reduced Greenhouse Gas Emissions due to CT clean energy consumption	L2	GHG emissions	TBD	GIS; EGRID, Calculated values	TBD	Significant increase in consumption (kWh) of clean energy generated will reduce greenhouse gas emissions
Reduced regulated air pollution due to CT clean energy consumption	L3	Nox, Sox, Ozone, other key air pollutants	TBD	GIS; EGRID, Calculated values	TBD	Significant increase in consumption (kWh) of clean energy generated will reduce regulated air pollutant emissions
Increase in energy security co-benefits	L4	Increased grid stability, reduced power outages	TBD	GIS, Utility reports	TBD	Significant increase in consumption (kWh) of clean energy generated will reduce risks associated with centralized transmission systems
Increase in economic co-benefits	L5	Jobs created in clean energy sector, reduced health risks, and higher business productivity	TBD	GIS, Modeling, Calculated values	TBD	Significant increase in consumption (kWh) of clean energy and advertising and promotion by partners and marketers will deliver economic co-benefits for CT residents and businesses
Clean energy marketing profitable without CCEF support	L6	Diversity of clean energy suppliers, REC marketers, and clean energy products	TBD	DPUC	TBD	Significant increase in consumption (kWh) of clean energy, advertising and promotion by partners and marketers, and an increased likelihood to purchase clean energy at going price levels will result in conditions that make clean energy marketing profitable without CCEF support
Market transformation to sustain clean energy demand	L7	Number of clean energy suppliers; sustained growth in clean energy purchasing; enduring preference for clean energy purchasing	TBD	DPUC, Survey research	TBD	Significant increase in advertising and promotion by partners and marketers, and an increased likelihood to purchase clean energy at going price levels will result in lasting market transformation to sustain clean energy demand

3.4 Dashboard Indicators

While all the metrics and indicators listed in the tables above are useful, only a subset should be tracked because of budget constraints and redundancies. On one hand, metrics in the more advanced stages of the program logic (intermediate or long-term outcomes) show the program's effectiveness; on the other hand, failure to measure the program products or initial results (outputs or short-term outcomes) will impede all efforts to establish causality in the program's effectiveness. Moreover, program metrics can vary widely in the cost to develop their indicators and the uncertainty associated with the indicator itself. For this reason, many social marketing programs choose to establish "Dashboards"— a set of essential indicators that can be tracked and updated regularly to communicate program performance. A dashboard is not intended to replace the performance measurement system itself; instead, it is intended to provide information on the most important program performance measures.

The proposed dashboard indicators are listed below in detail, referencing the Program Logic Indicator Identification Number, for ongoing tracking and reporting on a quarterly basis.

3.4.1 Program Objective 3A

For the voluntary market demand initiatives, the following indicators are proposed. Indicator identifiers from the Program Logic Model are in parentheses.

1. Number of Clean Energy Communities (T1)
    a. List of communities
    b. Map of communities
2. Number of Signups (S2 - Leading indicator)
    a. Clean Energy Communities
        i. Residential (S2 – S1a for all T1)
        ii. Nonresidential (S1a for all T1)
    b. Other Residential (S2 – S1a)
    c. Other Nonresidential (S1a)
    d. Comparison of sign-up penetration rate in 20% by 2010 towns versus non-20% by 2010 towns
    e. Top 20 Town Lists – Sign-ups and Penetration Rate
    f. Bubble Graph – Penetration Rate vs. Sign-Ups Chart
3. Signup to Customer conversion rate (Lagging indicator) (M1)
4. Projected KWh (M2 - Based on lagging indicator)
    a. Clean Energy Communities
        i. Residential
        ii. Nonresidential
    b. Other Residential
    c. Other Nonresidential
5. Projected Emission Reductions (L2 and L3 - Based on lagging indicator)
    a. GHGs
        i. Carbon equivalents
6. Projected fossil fuel combustion avoided (Based on lagging indicator)
    a. Million tons of coal

b. Million barrels of oil
c. Million cubic feet of methane
d. Tons of nuclear fuel
e. Cars off the road
f. Acres of trees planted

3.4.2 Program Objective 3B

For the public awareness and education initiatives, the following indicators are proposed. Indicator identifiers from the Program Logic Model are in parentheses.

1. Visitors to Science Centers
    a. Number to Clean Energy Trail (T8)
    b. Number to CT Science Center (T9)
    c. Number to collaboration centers (included in T9)
2. Number of small grant campaigns (T2)
    a. List
3. Earned media volume (S4)
    a. Number program specific and outcome related articles (S4a)
4. Media dollars Roll up
    a. Ad dollars spent (T7a)
    b. Ad equivalency (S4c)
5. Quarterly opinion poll and recall of SmartPower advertising (S6)
    a. Awareness and knowledge of CCEF specific activities ("Viability") (M4)
    b. Knowledge about how and where to purchase clean energy ("Availability") (M5)
    c. Awareness and knowledge of clean energy and specific technologies ("Substitutability") (M6)
    d. Understanding of the role of energy in society (S8)
    e. Understanding of the climate change issue (S9)

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Appendix A: Program Logic Document Example (Connecticut Clean Energy Communities)

Background and Context

Project Management

Project Manager
Bryan Garcia

Human Resource Requirements
It is anticipated that there will be minimal upfront human resources required to successfully implement this program beyond initial needs to market the program. The work of grassroots clean energy campaigns (e.g. SmartPower and its collaborators) will work to qualify cities and towns for the program. Human resources will be necessary once cities and towns begin to qualify for the program and solar PV system installation is required. The CCEF would likely issue an RFP for services to minimize the program costs and reduce human resource requirements to implement the program.

Prior Programs

The CCEF made direct investments in the suppliers of clean energy: Green Mountain Energy ($1 million – equity) and the Connecticut Energy Cooperative (~$1 million – convertible note), to support voluntary market development in Connecticut.

- GME left the state (in 2003) due to a low standard offer rate providing little business incentive to continue operations – *roughly 1,000 clean energy customers were returned back to the standard offer*.

- The Co-op went out of business (in 2002) due to exposure to spot market electricity prices in summer months, little cash on hand, and poor management – *roughly 2,500 clean energy customers were returned back to the standard offer*.

- In 2003, the CCEF and 5 foundations founded SmartPower, a 501(c)3 non-profit organization with the purpose of marketing clean energy and supporting voluntary market development in Connecticut. In 2004, SmartPower launched its community-focused 20% by 2010 clean energy campaign in New Haven. New Haven committed to that campaign as did the State of Connecticut – equivalent to 100 GWh of voluntary clean energy demand by 2010. This created the foundation for this Clean Energy Communities Program.

Similar Or Related CCEF Programs

Lessons Learned

- The market approach that this program will focus on evolved from the "lessons learned" of prior CCEF investments and program-related activities in combination with existing best practice voluntary market programs in the region.

- The lessons learned, in general, focus on providing targeted incentives to the market that are received only when successful results are demonstrated. These lessons learned include:

- Connecticut Energy Cooperative (CEC) – the late success of the CEC to acquire customers was based on a success-based acquisition model. The CEC increased its membership to 15,000 members in a 3-month period from only having 3,000 members prior to the direct marketing effort (which took two-years to achieve). We learned that having a strong value proposition, in this case it was a discounted electricity product, combined with a success-based incentive, in this case it was a $25 incentive per sign-up to the subcontracted marketer, that a residential campaign could be extremely successful.

- Connecticut Climate Change (CCC) – the recent work of the CCEF on CCC has identified how certain market segments can play a strong role in supporting clean energy purchasing through the climate change issue. The towns of Berlin, Bridgeport, Bristol, Burlington, Fairfield, Hamden, New Britain, New Haven, Plainville, Plymouth, Southington, Stamford, Weston, Windham, and Windsor have pledged to reduce greenhouse gas emissions and joined Cities for Climate Protection. Clean energy purchasing is among the top actions to achieve these reductions.

- Combining these lessons learned with the momentum of the following initiative will support residential and commercial market development for clean energy:

- SmartPower – SmartPower's 20% x 2010 campaign has grown at the community level. This campaign is serving as a rallying point for communities to set a target and subsequent voluntary purchase of clean energy.

Other States Experience/Programs

Massachusetts and Rhode Island clean energy funds currently have programs that provide incentives to encourage voluntary market demand for clean energy. Massachusetts is the only program that provides incentives to the consumer, whereas Rhode Island's program provide the incentive to the suppliers.

	MA	RI	CT
Program Name	Clean Energy Choice	Small Customer Program	Clean Energy Communities Program
Program Initiation	October 2004	April 2004	November 2004
Program Beneficiary	Consumer	Supplier	Consumer
Program Allocation	$2,500,000	$1,360,000	$550,000
Voluntary Demand Target (GWh)	N/A	N/A	50
Customer Sign-Up Target	From 3,200 to 7,500	From 0 to 14,133[71]	N/A
Estimated Average Acquisition Costs	581[72]	$96[73]	$150[74]
Estimated Efficiency Ratio ($/kWh)	$0.0692[75]	$0.0115[76]	$0.0110[77]

[71] Calculated based on allocation of $1,360,000 of which $125 per customer is available for first 6,000 customers ($750,000), then $75 per customer is available for outstanding funds remaining which comes to 8,133 customers ($610,000)
[72] Calculated based on program allocation of $2,500,000 divided by the differential number of customers being targeted of 4,300 customers (7,500 target minus 3,200 current customers)
[73] Calculated based on program allocation of $1,360,000 divided by the target number of customer sign-ups of 14,133 customers.
[74] Assumes $15,000/kW of installed solar PV (average of 1 kW and 2 kW of installed units) divided by 100 customer sign-ups to the ATSO program to qualify for the free solar PV installation.
[75] Assumes average consumer annual electricity usage of 8,400 kWh's (700 kWh's per month). Divides program allocation of $2,500,000 by the estimated annual electricity usage of 4,300 customers.
[76] Assumes average consumer annual electricity usage of 8,400 kWh's (700 kWh's per month). Divides program allocation of $1,360,000 by the estimated annual electricity usage of 14,133 customers.

- MRET, through its Clean Energy Choice program, provides federal tax deductions for clean energy purchases and matching grants for consumer communities and low income residents. They provide a 2:1 funding match for REC purchase.

- RIREF, through its Renewable Energy Incentive Program, provides an incentive to marketers of the Green-Up program of $125 per customer sign-up for the first 6,000 customers then $75 per customer sign-up for thereafter.

Direct and Indirect Objectives Served

Program Goal 3, Objective P3A and P3B, and Program Goal 1, Objective P1C

Expected Outcomes

- We anticipate that this program will open up another segment of the commercial marketplace for clean energy, specifically, municipalities. We would expect for municipalities to increase their interest in clean energy demand that would be exemplified by direct purchases or increased pipeline of projects for municipalities through CCEF RFP programs.

- Acquisition cost of no more than $200 per customer sign-up for the ATSO.

[77] Assumes average consumer annual electricity usage of 8,400 kWh's (700 kWh's per month). Divides program allocation of $550,000 by the target clean energy electricity usage of 50 GWh.

Program Structure

This pilot project uses a unique performance-based acquisition model intended to increase residential demand for the ATSO (Objective P3A) while increasing municipal commitments to purchase clean energy (Objective P3B).

It provides to "qualifying" Connecticut towns and cities in CL&P and UI territory 1 kW of "free" solar PV installations for every 100 ATSO sign-ups[78] that occur within their territory.[79]

In order to qualify for a "free" solar PV installation, a town or city must do the following:

1. Commit to the 20% x 2010 clean energy campaign;
2. Switch customers to the ATSO (every 100 sign-ups in a town or city qualifies for 1 kW of "free" solar PV system installation);
3. Allocate 100% of the energy savings that result from the installation of the "free" solar PV installation toward the town or city purchase of clean energy.

If this test pilot succeeds, then the program will be expanded with additional funding and potentially to include new commercial market segments (e.g. colleges and universities, school districts, etc.)

There are a variety of opportunities that will support the successful completion of this test pilot program that includes:

- Climate change leadership at the municipal level;
- "Free" clean energy being provided by the CCEF through this program;
- "Clean Energy – Let's Make More" marketing campaign; and
- Recognition by the general public in the need for alternative fuels and energy sources – Energy reliability, security, and independence.

Voluntary clean energy markets present significant challenges. If these challenges can be overcome, then the market for clean energy could move into maturity and the cultural norm.

Specific Program Objectives

This test pilot customer acquisition model expects to achieve the following results:

- At least the commitment of 10 new cities and towns to the 20% x 2010 Clean Energy Campaign that would provide future commercial clean energy market demand – output;
- Up to 50 GWh of communities purchasing clean energy – output;
- Up to 50 kW's of solar PV installations at a variety of Connecticut cities and towns – output;
- Up to 40 GWh of voluntary clean energy demand through the ATSO, equivalent to roughly 5,000 residential customers – outcome

Percentage of Initiative Achieved with this Program

If this program succeeds in communities committing and then purchasing 50 GWh of clean energy, then this program achieves 33% of the objective.

[78] Additional qualifying thresholds have been set to support small towns (10% of their ratepayers), or commercial customers (1 GWh of ATSO demand) that wish to support their communities clean energy efforts.

[79] Recognizing the need to reduce electricity consumption in SWCT, this program will provide qualifying towns and cities located in SWCT with 2 kW of "free" solar PV installations for every 100 ATSO sign-ups that occur within their territory.

Program Assumptions

- This program assumes that those cities and towns that commit to the 20% by 2010 campaign will then purchase clean energy to meet their commitment;
- This program assumes that communities will consider purchasing REC's in the statutory region where there are local environmental benefits and the cost is cheaper than New England-based REC's;
- This program assumes an average household equivalent of 700 kWh of electricity usage per month;
- This program assumes a $15,000 per kW installed costs for solar PV;

Target Market and Eligibility

Target Market

This program targets commercial and residential electricity customers in CL&P and UI territories (see table below):

	Customers	% of Total	Load (GWh)	% of Total
Residential				
CL&P	1,051,606	71.6%	9,326	32.9%
UI	286,331	19.5%	2,120	7.5%
Municipalities	57,050		493	
Commercial				
CL&P	95,987	6.5%	9,460	33.4%
UI	29,889	2.0%	2,476	8.7%
Municipalities	41,410		506	
Industrial				
CL&P	4,026	0.3%	3,850	13.6%
UI	1,707	0.1%	1,082	3.8%
Municipalities	148		616	
Total CL&P and UI Only	1,469,546		28,314	

The commercial market focus is Connecticut cities and towns. There are 169 towns and cities located throughout Connecticut, of which 165 of them are located within CL&P and UI service territories.[80] We estimate that the electric market demand for the towns and cities to be roughly 1,000 GWh,[81] or about 8.4% of the total commercial market for electricity in CL&P and UI service territories.

The target for this program is 50 GWh or 5% of the electric demand for communities.

Eligibility Criteria

This program is available to Connecticut cities and towns in CL&P and UI territory – 165 towns. Should the municipal energy cooperatives serving the remaining 4 towns devise a clean energy product offering (i.e. ATSO) for their customers, then those 4 towns can qualify themselves to participate in the program.

[80] CMEEC service territories include Bozrah, Groton, Norwich, and Wallingford

[81] Based on a communication with CCM, their 144 members pay $100 million a year in electricity costs at an average price of $0.11 per kWh. This amounts to roughly 910 GWh. Of the remaining 21 towns that are not CCM members, but located within CL&P and UI territories, we estimate an additional 85 GWh of electricity demand.

Partners and Leverage

There will be a variety of program partners engaged over time that include:

- SmartPower – the key partner promoting the 20% x 2010 Clean Energy Campaign and ATSO sign-ups through its grassroots collaborators;
- Connecticut Conference of Municipalities (CCM) – key partner to provide access for program information dissemination to Connecticut cities and towns;
- Connecticut Organization of Small Towns (COST) - key partner to provide access for program information dissemination to Connecticut cities and towns; and
- EPA – through the Clean Energy Environment State Partnership Program, still in development, and the Green Power Partnership, assistance will be provided to support clean energy aggregation and purchasing.

Other program partners will be solicited as the opportunities arise and on an as needed basis.

Funding Structure and Amounts

$10,000 in funding will be required for each kW of free solar PV the town or city qualifies for. Funding will be provided directly to a competitively-identified subcontractor that will be responsible for installing the system.

Program Funding Level and Type

This test pilot program has a $550,000 budget: $50,000 for marketing and $500,000 for the installation of solar PV systems ($10,000/kW) for qualifying cities and towns. $250,000 of this budget is expected to be funded by the sale of CCEF-owned REC's, and a match of $250,000 will come from Program Goal 1, Objective P1C.

Clean Energy Communities is a program investment of the CCEF. The program was designed internally with feedback from outside stakeholders including clean energy advocates and marketers.

Level of Support for Individual Awards

There is no limit to the amount of free solar PV that a qualifying city or town can receive in this program up to the board approved program allocation. Towns located in the grid-congested areas of Southwest Connecticut will receive an additional benefit for qualification – 2 kW for each qualifying threshold achieved.

Financial Structure of Awards

Direct subsidy or grant to qualifying cities or towns in the form of installed solar PV systems.

Key Terms of Award

Cities or towns must qualify in order to participate in the program.

Process and Timeline

This is a non-competitive program that cities and towns qualify for by meeting the eligibility requirements.

There is no need for an advisory or review committee at this time because the parameters to qualify in the program are clear. Should there be a need to setup an advisory or review committee as new things develop, this option will be available.

The following are key milestones for the program:

- Announce the program by December 31, 2004
- Solidify partners for program implementation by April 1, 2005
- Develop marketing materials to support program implementation by April 1, 2005
- Key milestone targets:
    - 5 kW free solar PV qualified, 10 20% by 2010 Clean Energy Campaign supporting cities or towns, and 1,000 customers to the "CT Clean Energy Options" program – June 30, 2005
    - 15 kW additional free solar PV qualified, 10 additional 20% by 2010 Clean Energy Campaign supporting cities or towns, and 3,000 additional customers to the "CT Clean Energy Options" program – December 31, 2005
    - 30 kW additional free solar PV qualified, 30 additional 20% by 2010 Clean Energy Campaign supporting cities or towns, and 6,000 additional customers to the "CT Clean Energy Options" program – December 31, 2006
    - 50 GWh of voluntary clean energy demand by Connecticut cities and towns – December 31, 2007
- Identify qualified subcontractor to install solar PV systems – August 31, 2005
- Install 1st batch of qualifying systems – December 31, 2005

Evaluation Criteria

CCEF will have to work with the ATSO suppliers and SmartPower to determine qualifying cities and towns.

Risk Analysis

There are a variety of threats that pose risks for the successful completion of this test pilot program that includes:

- Premium price of clean energy;
- Additional rising electricity prices in the state on top of premium price of clean energy – clean energy demand elasticity will be tested;
- Perceived quality of the ATSO products;
- Unforeseen market changes or market entrants (i.e. Levco Energy, LLC);
- Policy risk to the ATSO marketers; and
- Budget concerns at the municipal level.

Voluntary clean energy markets present significant challenges. Numerous threats will be presented over time that will impact the probability of success of the program.