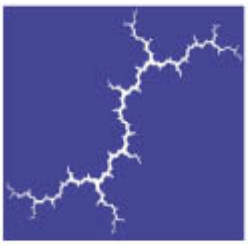

Synapse
Energy Economics, Inc.

OCC Comments on Alternative Transitional Standard Offers

Prepared by:
William Steinhurst, Paul Chernick, Tim Woolf, John Plunkett, and Cliff Chen
Synapse Energy Economics
22 Pearl Street, Cambridge, MA 02139
www.synapse-energy.com
617-661-3248

Prepared for:
State of Connecticut
Office of Consumer Counsel

October 20, 2003

Table of Contents

EXECUTIVE SUMMARY

The Department of Public Utility Control should require the electric distribution companies to procure a variety of Alternative Transitional Standard Offers that will promote the generation of electricity through renewable sources or the efficient use of energy resources in Connecticut. Such alternative Offers have significant potential to improve market stability and efficiency for all customers, to ameliorate environmental impacts of many kinds by reducing the combustion of fossil fuels, and to eventually reduce customer bills.

The Department should take into account the following specific recommendations as to the procurement of Alternative Transitional Standard Offers:

1. To promote competition and ensure quality products, customers should be able to choose from one of several "green" options that promote renewable generation.

2. Procurement of energy efficiency offers should be structured to permit and facilitate optional time-of-use rates.

3. Procurement requirements should promote price stability, but should not mandate any specific form of guarantee. Rather, the guarantees offered, if any, should be factored into the evaluation of bids.

4. Offers that deliver to customers the hedge value of renewables should be considered favorably.

5. Bids should be required to facilitate customer participation in green power programs by allowing enrollment by phone, mail, and Internet.

6. Customer service representatives must be trained to understand the product offerings and be able to clearly articulate their benefits to customers.

7. Procurement should discourage or prohibit imposing contractual requirements on customers participating in renewable generation alternatives unless there is a substantial investment in generating equipment on the customer's premises.

8. Energy efficiency alternatives making extensive investments on customer premises should be permitted to require reasonable minimum participation periods.

9. Neither renewable energy nor energy efficiency alternative TSOs should generally require mandatory purchase of any other product or service of any kind except for very limited situations described in Section 6 of this report.

10. Specific marketing to non-residential markets should be encouraged and evaluated in bid selection.

11. Procurement should encourage programs to allow customers to sign up by directly contacting their electricity supplier (default or otherwise) or distribution company.

12. Integration of billing (provision of a single bill for distribution, TSO and alternative TSO service) should be strongly encouraged or required.

13. Initial procurement should be for programs that would continue to be offered for at least two years in order to encourage bidding and provide a reasonably stable platform for planning and power procurement.

14. Clear, uniform labeling and disclosure of renewable content, energy efficiency to be provided, and price and terms should be required of all offers.

15. The Department should consider an independent public education campaign to precede and accompany Alternative TSO offers.

16. Procurement should encourage and favor methods for transferring the non-environmental benefits of renewable energy, such as their hedging value, to participating customers.

17. Procurement should encourage the targeting of specific programs to Southwestern Connecticut to alleviate the transmission crisis in that area.

1. Introduction

The Connecticut General Assembly has recently passed legislation (Public Act (PA) 03-135) authorizing the Department of Public Utility Control (DPUC, Department) to order certain utilities to offer, through electric suppliers, "one or more alternative" Transitional Service Offer (TSO) or Standard Service (SS) options addressing renewable generation and energy efficiency.[1] Specifically, such an order requiring alternative TSO (Alternative TSO) or alternative SS options, if issued, *must* include an option "that consists of the provision of electric generation services that exceed the renewable portfolio standards established in section 16-245a, as amended." [2] Those offers required by the DPUC may also include additional options, including but not limited to "an option that utilizes strategies or technologies that reduce the overall consumption of electricity of the customer." We understand the statute to mean that those additional "options" may include any form of renewable electricity generation product (in addition to the aforementioned one that "exceeds" the renewable portfolio standard (RPS)), as well as the full range of offers whose purpose is to reduce overall consumption of electricity.

The DPUC has established Docket No. 03-07-16 to consider whether it should require such offers and, if so, how those offers should be structured, procured, and implemented. The purposes of this report are to provide analysis of the issues surrounding the Docket's subject matter and to make recommendations regarding whether the DPUC should order the affected utilities to procure Alternative TSO, and if so what kinds and in what manner. As set forth in detail below, we recommend that DPUC require procurement of both renewable energy and energy efficiency offers, and that the procurement be open to a broad range of alternatives in each area.

2. The DPUC Should Require both Renewable Energy and Energy Efficiency Procurement and Offers

Alternative TSO as contemplated in PA 03-135 and this proceeding are forms of so-called "green pricing." Public Act 03-135 encourages the Department to consider a TSO "option that consists of provision of electric generation services that exceed the renewable portfolio standards established in section 16-245a, as amended by [that] act" and a TSO option "that utilizes strategies or technologies that reduce the overall consumption of electricity of the customer." Thus, the concept of green pricing has been expanded in Connecticut to include offers that provide load reduction services.

Green pricing was originally conceived to be an optional electric rate or price for renewable resources, giving captive customers of a regulated monopoly utility some

[1] The affected utilities are Connecticut Light & Power Company (CL&P) and United Illuminating (UI).

[2] Although the recent legislation (P.A. 03-135) refers to alternative TSO and alternative SS options, in the remainder of these comments we will refer solely to Alternative TSO because alternative SS options will not become effective until 2007.

choice over the fuel source of the power they purchased and adding to the quantity of renewables selected by the monopoly utility as being cost effective in integrated resource planning.[3]

During the transition to competitive retail electric service, many anticipated that vendors would make green pricing products widely available, along with retail products reflecting varying degrees of insulation from market fluctuations that would appeal to the varying risk preferences of customers. While such products have been offered in some jurisdictions, the fact is that the overwhelming majority of retail customers, especially residential and small commercial customers, remain on transitional or standard offer service. Customers in most jurisdictions lack the ability to select products with varying characteristics, whether in terms of renewable generation, market risk choices, or efficiency improvements.

Some degree of renewable energy is (or will be) provided to Connecticut TSO consumers through the renewable portfolio standard (RPS) established in Connecticut General Statutes (Conn. Gen. Stat.) Section 16-245a and the Clean Energy Fund, a/k/a Renewable Energy Investment Fund, established under Conn. Gen. Stat. Section 16-245n. Likewise, a certain amount of energy efficiency service is (or will be) available through the Energy Conservation and Load Management Fund (C&LM Fund) established under Conn. Gen. Stat. Section 16-245m. However, there is evidence that consumers desire more reliance on renewable generation than will be provided by the RPS and Clean Energy Fund, and the C&LM Fund is clearly not sized to capture all cost effective conservation measures, as evidenced by the fact that the full budget allotment of $87 million in 2002 for the C&LM Fund is projected to save approximately $373 million over the life of the measures installed in 2002, and the fact that the C&LM Fund was cut as part of the state budget process. (ECMB, 2003; PA 03-1, Section 20). Thus, these existing mechanisms do not exhaust the individual preferences of consumers for renewable generation or energy efficiency.

There are several reasons why the Department should decide to establish alternative TSOs that provide energy from renewable generation or that use energy efficiency and other load-reducing options to provide part or all of participating customers' energy services:

- The public strongly supports increased renewable generation and energy efficiency.[4]
- Connecticut's recent energy-efficiency efforts have been limited by budget constraints.[5] There is significant unmet demand for the existing energy-efficiency

[3] This is not to imply that renewable resources now available are not cost-effective, especially on a lifetime levelized basis. See, for example, Woolf, et al., 2003.

[4] Customer surveys consistently find that 50 to 95 percent of Americans say they are willing to pay a premium for renewable energy. (Wiser, et al., 2001)

[5] The utilities have generally seen the majority of their annual DSM budgets committed by customer requests in the first quarter of the year, with the entire budget committed by the end of summer, even before the recent reduction in DSM funding due to state budget problems. See the utilities' quarterly Conservation and Load Management Status Reports (Docket No. 99-09-30), including: CL&P First,

programs. The reduction in energy-efficiency budgets to offset state budget shortfalls will increase this shortfall.

- Connecticut's current RPS does not capture all societally beneficial opportunities to develop or procure renewable generation.
- Energy efficiency is generally the lowest-cost resource available to the regional energy system.
- Increasing energy efficiency reduces the direct costs of electric energy generation.
- Increasing energy efficiency and adding new renewable generation reduces the environmental effects of operating generation plants, the market price for energy (particularly in a transmission-constrained area) and the market power of the dominant owners of regional generation.
- Energy efficiency and locally sited renewable generation reduce power flows on the transmission and distribution system, and hence losses of energy and capacity.
- Energy efficiency in an area with distribution or transmission constraints reduces or defers the need for expensive upgrades to the distribution and transmission systems, as well as the environmental damages from the construction of those facilities.

Thus, consumers as a group, whether participants in an Alternative TSO or not, will benefit in significant ways from additional development and implementation of renewable generation and energy efficiency. The remainder of this section will review the background for these reasons.

Most types of renewable generation have cost structures that are fundamentally uninfluenced by fossil fuel prices and wholesale electric market prices. Wind, photovoltaic, and hydroelectric generation costs, for example, are essentially independent of fossil fuel prices.[6] Thus, additional renewable energy supplied in or delivered to the New England regional market will have several beneficial effects. First, adding new renewable generation means that a greater portion of the supply being bid into the market is not affected by fossil fuel price fluctuations, moderating wholesale electric market price volatility for all customers. Second, many renewable generation technologies are not dispatchable, so they are ordinarily bid into the market at a zero price to ensure their output is purchased whenever it is available. The effect of adding to the market auction power bid at zero price is to reduce the market-clearing price for all buyers. This is because, while the market clearing price is set by the bid price of the most expensive generator actually dispatched, having zero bid generation added to the "bottom" of the

---

Second, and Third Quarter 2001 Status Reports, Attachment B; United Illuminating Second Quarter 2001 Status Report to the ECMB, August 14 2001, at 2.

[6] These technologies do require varying amounts of maintenance that involves motor vehicle travel or use of motorized equipment, but the cost of these inputs is a very minor part of the total cost of their output. In addition, to a minor extent, labor and other inputs for operation and maintenance reflect overall inflation, which, in turn, reflects fossil fuel prices. These small impacts do not negate the overall observation that the technologies have costs that are for the most part independent of fossil fuel prices.

market bid stack will cause the ISO to pass over expensive sources that would otherwise have been needed, causing the clearing price to be set by a lower price source.[7] This dynamic has the beneficial side effect of mitigating the market power of suppliers, which can result in significant cost savings for all consumers in the market. In addition, to the extent that such generation is added within a congested region, locational marginal pricing adders, line losses, transmission and distribution (T&D) upgrade costs, and other savings will accrue as well.

It is also clear that Alternative TSO offers that reduce total consumption of electricity through energy efficiency will offer many of the same non-participant benefits brought by renewable generation. Load reductions reduce market clearing prices and price volatility in the same manner as renewable generation, but with the added advantage that these impacts are, on average, strongest when loads are highest, precisely the times when reducing prices, volatility and market power are most valuable. (Nadel 2000)

There is a risk that establishment of Alternative TSO offers will create some level of administrative costs for the affected utilities and the Department. However, these costs can be minimized by careful program design, prudent implementation, and, perhaps, by conducting a unified solicitation (joint bidding) for the two affected utilities and by making the same offerings to their customers, which would have the side benefit of streamlining customer education.

In addition, these offers would deliver substantial environmental benefits, including reduced air emissions and reduced land use impacts from generation and T&D construction, as well as mitigate the risks associated with future environmental requirements, such as carbon dioxide (CO2) emission limits. On balance and in view of the participant and non-participant benefits described above, we recommend that the Department exercise its authority under the act and require CL&P and UI to procure, under the Department's supervision, Alternative TSO offers for both renewable energy and reduction of consumption. Specific program recommendations are set out below.

[7] One might wonder whether this matters if, as might be the case, the renewable power is more expensive than the clearing price. The effect is still genuine and important. Suppose, for the sake of argument, that a renewable technology's cost exceeds the average market price of power. The premise underlying the concept of Alternative TSO or SS is that some consumers will prefer for their own reasons to purchase that product with the result that some new renewable generation is added to the regional mix. Once that has happened, the impact of zero bid pricing of that power follows, regardless of the total cost of the renewable generation. In passing, it is worth noting that zero bid pricing for renewable energy improves the economic efficiency of the market because the marginal variable cost of production for many of those technologies is, in truth, zero. This contrasts with the situation for large nuclear plants, which are also usually bid into the market at a price of zero to ensure they are always dispatched. This is necessary for safety and engineering reasons, but represents an at least theoretical inefficiency from an economic perspective because their variable cost of production is not actually zero. Of course, it is also true for most currently available renewable technologies that New England regional market prices in many hours exceed the levelized prices of those technologies. The savings in those hours are very large and are the ones most important to this effect.

3. Renewable Energy Options and Recommendations

3.1 Rationale for Renewable Generation TSO Alternatives

Public Act 03-135 encourages the Department to consider TSOs "that exceed the renewable portfolio standards established in section 16-245a, as amended." There are several reasons for the Department to establish alternative TSOs that exceed the RPS:

- Renewable energy technologies provide a sustainable way of meeting energy needs with minimal impact on the environment. Emissions from conventional methods of generating electricity are the cause of numerous health and environmental problems, and mounting evidence of the link between fossil fuel burning activities and climate change underscores the importance of finding alternative means of producing energy. Renewable energy increases fuel diversity and reduces the risks of price volatility while contributing to local economic development.
- Unlike fossil fuel-based power plants, which produce harmful air pollutants and large quantities of carbon dioxide, many renewable energy sources generate electricity while releasing zero or relatively minor levels of emissions. Growing concerns over the human health and environmental impacts of conventional electricity generation have sparked interest in renewable energy technologies, several of which rely on free, non-depletable sources of power.
- Recent natural gas price volatility emphasizes the need for a diverse portfolio of electricity generating resources. Relying on generation from renewable resources increases fuel diversity and reduces the financial risk of electricity price spikes due to fossil fuel price volatility. A report by the Lawrence Berkeley National Laboratory quantifies the hedge value of renewable energy by equating it with the stability premium for natural gas. The report determined this value to be roughly 0.50 ¢/kWh. (Bolinger, et al., 2002)
- In addition to serving as a hedge against volatile natural gas prices, increasing renewable generation also reduces natural gas demand, which mitigates the cost impacts of renewable energy. A study by the U.S. Energy Information Administration (EIA) found that the retail price impacts of a proposed 10% national RPS would be largely offset by lower gas prices that result from reduced gas use. (EIA 2002)
- Investing in renewable energy technologies is also a way of hedging uncertainty over potential environmental regulations. Should legislation or international agreements pertaining to criteria pollutants and carbon dioxide emissions become more stringent in the future (as they already have in several countries), taking actions to reduce emissions immediately with renewable resources will be far less costly than doing so reactively in the future.
- The entire State of Connecticut has been deemed a non-attainment area for ozone under the United States Environmental Protection Agency's (EPA) National

Ambient Air Quality Standards (NAAQS), and the City of New Haven has also been deemed a nonattainment area as to particulate matter no greater than 10 micrometers in diameter (PM10).[8] (CT DEP 2002) In locations deemed non-attainment areas under EPA's NAAQS, environmental policies such as the Alternative TSO (and RPS) can help the state demonstrate positive action to increase the region's air quality, potentially ameliorating the negative impacts of non-attainment.

- Renewable energy can also be a significant source of local economic development. Wind energy, for example, provides more than five times as many jobs per dollar invested as coal or nuclear power. (US DOE 2003) The growth of a robust market for renewable technologies will create jobs and enterprises that build, market, and maintain these technologies. Connecticut has recognized the need for leadership in this field through development of the Connecticut Global Fuel Cell Center for fuel cell research, education and product development. It seeks to make Connecticut "the primary global venue for the fuel cell industry" through research and development of advanced fuel cell technology, educating a fuel cell technology workforce, information transfer, and demonstration activities. An Alternative TSO that accommodates fuel cell projects (as a transition technology to bridge to a clean, sustainable energy supply) can help leverage those investments. (CT GFCC 2003)

Public policies such as the Alternative TSO and the RPS are needed to help capture these potential significant benefits for TSO consumers and for the public and to promote electricity resources that are in the best interest of society, in general.

The Alternative TSO contemplated by statute is a market-based policy, in that it relies on competitive markets to generate specified amounts of renewable electricity to meet consumer demand. As the market share of renewable conversion technologies expands and as these technologies take advantage of economies of scale, their costs are expected to decrease. A renewable energy policy should strive to disseminate the benefits of renewable energy while reducing the cost differential between renewable power and energy from conventional sources. A well-conceived Alternative TSO, in conjunction with the existing RPS, will be an effective and efficient means of accomplishing these goals.

3.2 Renewable Energy Options in Other States

Nearly 40 percent of U.S. electricity customers now have access to a green power product from either their utility or from a competitive power supplier. (Swezey 2002) The experience obtained from the growth of green power programs in recent years provides Connecticut with important examples, both positive and negative, of the key elements of these programs.

[8] The Connecticut Department of Environmental Protection expects New Haven to be redesignated as an attainment area for PM10. However, during 2003/2004, EPA is expected to implement attainment/non-attainment designations for the new, stricter PM2.5 standard.

The sheer number of different green pricing and marketing programs has led to significant variations in product offerings. The key elements of these programs, along with illustrative examples, are summarized below.

Key Program Elements

Product Design

Product design encapsulates the structure and composition of a green power product offering. Product offerings can be generally divided into three categories, although some recently designed products have begun combining aspects of different categories:

Fixed Block – This allows customers to purchase a fixed amount of renewable generation each month.

Percent Energy Usage – Such programs enable customers to purchase a percentage of their electricity use from renewable generation. Most percent-based programs include an option that allows customers to purchase up to 100 percent of their electricity consumption from renewable energy.

Contribution – This gives customers the option of contributing money to fund renewable project development. In some instances, contribution programs are designed to fund the installation of small photovoltaic systems at community sites, particularly at local schools. Customers can typically determine the amount of their monthly donation, although some utilities require minimum contribution levels.

The composition of some renewable products varies according to the renewable resources that are locally available and a green power marketer's access to those resources. Because of its popularity with the public and its relatively low cost premium over conventional resources in several regions of the country, wind power is commonly offered as a part or all of a green power product. Landfill gas and hydropower also often comprise portions of green product portfolios. Biomass, solar power, geothermal energy are less commonly included.

Green power can either be supplied by actually delivering bulk renewable generation to meet the electric distributor's retail load, or by supplying green certificates, also known as "green tags" or tradable renewable certificates (TRCs), which capture the attributes of renewable generation and can be sold and tracked separately from the kilowatt-hours that are generated.[9] The latter approach has become the basis for most green power transactions in restructured electricity markets, including the renewable portfolio standards in Massachusetts and Connecticut.

With the advent of TRCs, it is now possible for an electricity supplier in New England to purchase renewable attributes from a generator in Texas. However, allowing TRCs generated outside of a state or control area to be sold as green power raises certain questions about the benefits to the region in which they are sold. If local air quality,

[9] It is also possible, in some situations, for the renewable generation to be on the customer's side of the meter, thus reducing load rather than delivering power to the grid, but having the same conceptual benefits as an actual delivery to the grid serving the customer.

economic development, and fuel diversity are goals of implementing a green power program, then progress towards those goals can be maximized by allowing only TRCs purchased from local or in-region renewable facilities to be eligible for green power sales. Additionally, green marketing programs may receive a more positive response if the program supports in-state or in-region renewable energy projects. Public Act 03-135 addresses this issue by generally requiring that renewable energy sources be located in New England, or, in certain circumstances, in New York, New Jersey, Pennsylvania, Maryland or Delaware, in order to meet the RPS. Most green power product labels now are required to disclose (or voluntarily disclose) both the name and location of the renewable facilities where the TRCs being sold were generated.

A key characteristic of a renewable product offering is whether it includes new or existing renewable resources and in what proportions. The majority of green power products are designed to support the development of new renewable resources, which provide the greatest marginal environmental benefit. The Green-e program, which is the largest national certifier of green power products, typically defines a renewable resource as "new" if it was placed in operation, repowered, or significantly upgraded after 1998 or 1999. Virtually all of the potential purposes for an Alternative TSO can be best realized if only new renewable resources are authorized for inclusion, and that effect will be maximized by defining new resources as those qualifying as new under the Green-e criteria (on or after January 1, 1998), the Connecticut RPS criteria (on or after July 1, 1998), some more recent date or, even more aggressively, only those entering service after the effective date of any order establishing the program. This is because the contributions that existing resources make towards those goals will be neither increased nor decreased by including them in an Alternative TSO, except to the extent that such designation might prevent the decommissioning of an existing renewable resource. Therefore, a green product's effectiveness is enhanced by requiring a relatively large fraction of "new" renewables, perhaps even 100%.

Pricing

Green power premiums typically range from one to three cents per kWh. Within certain limits, there does not appear to be a definitive relationship between the amount of a utility green pricing premium and program participation rates. (Swezey and Bird 2001) One report states that "the data suggest that perhaps the quality of the [green power] product and how well it is marketed, the credibility of the utility offering the program, or the ease of participation are more important determinants of participation." (Wiser, Bolinger, and Holt 2000)

While the price of a green power product may be less important in a regulated electricity environment where customers may not be presented with competing pricing options, in a restructured electricity market such as Connecticut's, the pricing of a product is a way for electricity suppliers to distinguish and demonstrate the value of their product.

To ensure that customers receive fair value for their green power product payments and to ensure a competitive environment for green power providers, customers should be able to choose from several different green power providers. The newly minted GreenUP program in Massachusetts provides standard offer customers with the opportunity to choose from four different green power providers, each offering products with premiums

over the normal retail price ranging from 1.2 cents to 2.5 cents per kWh. Allowing multiple vendors also increases the scope of products offered, which provides customers with more choices and can lead to higher participation rates.

It is also important to provide customers with some guarantee of price stability. This usually involves offering a fixed premium amount for a specified period. While most green power programs have fixed premium amounts, the vast majority do not allow customers to take advantage of the economic benefits of renewable energy as a hedge against high prices of conventional electricity generation. The hedge value of renewables is a particularly significant benefit in light of the unprecedented volatility of natural gas prices over the past two years.[10]

Program Marketing and Implementation

The manner in which an electricity supplier markets and implements a green power program is critical to the program's success. Electricity suppliers commonly use targeted mailings, bill inserts, and mass marketing to promote and raise awareness of their green power products.

Electric suppliers must also facilitate customer participation in green power programs by providing several enrollment opportunities, including by phone, mail, and Internet. Customer service representatives should also have the training, supervision and quality control systems to understand the product offerings, clearly articulate their benefits to customers, and support them in their use of those offerings. Imposing contractual requirements on customers is largely unnecessary due to the low turnover reported by green power suppliers. (Swezey and Bird 2001) The easier it is for customers to participate in green power programs, the more market penetration the programs can hope to achieve.

While residential customers initially dominated the green power market, non-residential electricity consumers such as commercial businesses, government agencies, and religious organizations have begun participating in increasing numbers. To best capture this market segment, electricity suppliers should actively market to non-residential customers. Publicly recognizing these customers on a website or newsletter is a common marketing strategy.

Green power marketers can further help their cause by partnering with environmental advocacy organizations and certifying their products with a certification program such as Green-e. The experience of other green power programs suggests that partnerships with environmental groups are most effective when the outside groups are involved at the initial product development and program design stages. (Swezey and Bird 2001) Such relationships serve to improve the marketers' credibility and increase consumer confidence in the value and quality of the product.

---

[10] Despite this observation, both Alternative TSO participants and non-participants will definitely benefit from the effect new renewables have on moderating market-wide price volatility and mitigating market power of suppliers. It is only their own ability to fully hedge their own long-term price risk that is at issue here.

Review of Programs in Other Regions

According to NREL's Green Power Network, there are currently 24 active retail green power marketers serving nine states and the District of Columbia. Among states that have not restructured, the utilities with green pricing programs numbers in the hundreds.

The green power programs detailed below have features that may be particularly relevant to Alternative TSO in Connecticut.

Niagara Mohawk GreenUp

The Niagara Mohawk (NiMo) GreenUp program recently completed its first year of operation, having enrolled 7,700 customers. This represents just 0.5 percent of NiMo's 1.5 million electric customers, but other green power programs have experienced similarly low participation rates in their startup years.

GreenUp allows residential and commercial customers to choose from five different renewable energy products offered by four retail green power marketers: Community Energy, EnviroGen, Green Mountain Energy, and Sterling Planet. The premium amounts range from 1.0 to 2.0 cents per kWh, and both fixed block and 100 percent energy usage products are available.

Customers can enroll in GreenUp by mailing in a postage-paid enrollment card included with their monthly bill at least once a year, by directly calling the green power marketer, or by visiting the green power marketer's website. However, customers cannot enroll in the program by contacting a NiMo Customer Service Representative. This may discourage some customers who have not heard of any of the GreenUp providers from enrolling. Allowing customers to sign up by directly contacting their default electricity distributor, which has incumbent name recognition, would enhance the ease of participation and potentially increase participation rates.

The creation of the GreenUp program was mandated by a merger agreement. The program is an example of the green marketer platform model in which the default service provider promotes the program, but does not engage in joint marketing with any of its green power providers or receive any substantial revenue. GreenUp charges are included as a tariff on customer bills.

The passive marketing of NiMo may have limited the success of the GreenUp program. Given the marketing and customer education obstacles that green marketing programs already face, it seems doubtful that requiring the traditional service supplier to provide bill inserts advertising the GreenUp program only once a year would engender high levels of customer demand response.

NYSEG Catch the Wind

In contrast to Niagara Mohawk's GreenUp program, the NYSEG Catch the Wind program is based on a cooperative marketing agreement between the default service provider and a green power marketer. Under this agreement, NYSEG and Community Energy, Inc. (CEI) have adopted a shared approach to marketing, revenues, decision-making, procurement, and product branding. Whereas Niagara Mohawk has limited the use of its brand by the GreenUp providers, NYSEG's product is co-branded with CEI.

Lending the default service provider's name to the product can provide a marketing advantage if it leads to greater consumer acceptance.

CEI claims that jointly acquiring wind generation with NYSEG combines the strengths of both parties and results in a lower price. In particular, CEI has contacts and relationships with wind energy suppliers, and NYSEG provided the financial backing of a creditworthy entity. While this arrangement may have allowed CEI to negotiate a lower generator contract price, the Catch the Wind product price is still 0.5 cents per kWh higher than its otherwise identical GreenUp offering. In addition, CEI offers both fixed block and options for a percentage of energy used in the GreenUp program, but the Catch the Wind product provides fixed block purchases as the only product option. This appears to be a result of limitations with NYSEG's customer information and billing system, which require Catch the Wind customers to be billed separately from their normal electricity bills.

The higher price of the NYSEG/CEI product could be a result of higher revenue requirements to cover NYSEG's administrative and marketing costs. While the cooperative agreement between NYSEG and CEI confer advantages to the Catch the Wind program, such as the ability for customers to sign up directly with NYSEG, the program is limited by the lack of billing integration. Requiring customers to be billed separately from their normal electricity statement is likely a significant deterrent to potential customers.

Massachusetts Electric and Nantucket Electric GreenUp

Massachusetts Electric and Nantucket Electric, which are electric distribution subsidiaries of National Grid, recently announced the creation of a GreenUp program similar to that of Niagara Mohawk's. The Massachusetts GreenUp allows residential and small business customers a choice of seven different green power products offered by four green power marketers. Six of the products are Green-e certified.

The product premiums range from 1.2 to 2.5 cents per kWh. Interestingly, the GreenUp products in Massachusetts all consist of at least 50 percent small hydro, and most products contain a greater percentage of biomass than of wind. This may be the result of the very small amount of wind capacity in New England compared to New York. As more wind capacity comes online, green power providers in the region should strive to market products that contain more generation from wind.

Features that GreenUp in Massachusetts has in common with its New York counterpart include:

- Customers can enroll by mailing in a postage-paid enrollment card that is sent with customer bills or by contacting the green power provider directly
- Neither Massachusetts Electric nor Nantucket Electric handles any GreenUp customer service duties
- GreenUp charges are shown as a separate line item on customers' normal monthly electricity bills

Washington State Alternative Energy Products

In 2001, 16 of Washington's electric utilities were directed to offer a voluntary "qualified alternative energy product" by January 2002. Utilities were given the option to procure renewable generation or TRCs.

About 0.55 percent of utility customers enrolled in the first year of the green pricing programs, which is roughly the same percentage that enrolled in Niagara Mohawk's GreenUp program in the first year of its existence. Wind power is the dominant resource, comprising approximately 90 percent of the green pricing programs. Most programs are based on fixed-block sales, with premiums ranging from one to four cents per kWh. Some utilities are soliciting contributions to pay for the above-market cost of purchased green power. The most common sources of green power for Washington's green pricing programs are purchases of Bonneville Power Administration's Environmentally Preferred Power and Bonneville Environmental Foundation's Green Tags.

The Washington Utilities and Transportation Commission surveyed the utility green pricing programs in October 2002 and issued a report summarizing its findings. As one might expect, utility program managers reported challenges such as marketing and recruitment and explaining the complex and abstract nature of electricity. The latter was especially true with utilities that sold green tags. Several program managers pointed to a clause in the legislation stating that "all costs and benefits" of the programs should "accrue to program participants" as posing a unique marketing challenge. Some program managers felt that this clause restricted their ability to market the program until the program obtained sufficient revenues to do so, and others ignored the clause and used general funds for marketing expenditures.

A noteworthy aspect of the green pricing programs in Washington was the high level of collaboration between environmental organizations and utilities. In the fall of 2001, environmental groups sponsored two workshops to assist utilities in the design, development, and marketing of their green pricing programs. The involvement of environmental organizations may help explain the preeminence of wind power in the green pricing programs.

Portland General Electric and Pacific Power Environmental Power Options

Oregon's electricity restructuring law, which passed in 2001, requires Oregon's two investor-owned utilities, Portland General Electric (PGE) and Pacific Power, to provide a specific residential portfolio of green power options. In March 2002, the utilities began offering three green power options: fixed block, percent energy usage, and a "Habitat" option that combines a 100 percent energy usage product with a contribution to salmon habitat restoration funds.

PGE's fixed block option is its Clean Wind program, which allows customers to purchase 100 kWh blocks of new wind generation for $3.50 per block. Pacific Power's corollary is its Blue Sky program, which also offers 100 kWh blocks for the lower price of $1.95 per block. Both utilities had been offering these green pricing products since 2000.

Oregon's restructuring legislation required the use of third party renewable suppliers. To fulfill this requirement, both utilities contracted with Green Mountain Power to provide a

100 percent renewable energy usage product. PGE's Green Mountain option is comprised of 80 percent (non-new) geothermal energy and 20 percent wind energy, and Pacific Power's option contains 85 percent geothermal and 15 percent wind. The high percentage of relatively low priced geothermal energy enables the product to be sold at a low price; the premium for PGE's product is 0.8 cents per kWh, and Pacific Power's premium is 0.78 cents per kWh.

The Habitat option, which is branded as the Green Mountain Energy Salmon Friendly Plan, adds a voluntary contribution component to the Green Mountain percent energy usage product. Customers are asked to contribute an additional amount to the salmon habitat restoration fund of For the Sake of the Salmon, a nonprofit organization. In all other respects, the Habitat option and the Green Mountain options are identical. PGE's Salmon Friendly plan asks customers to contribute an additional 0.11 cents per kWh of all of their monthly generation, while Pacific Power's customers are asked to contribute a flat $2.50 per month.

The Oregon utilities present an interesting model for green power sales in a restructured market. Both utilities have created their own, branded products while also contracting with a third-party green power provider to provide additional options. The utilities are required to market all three options equally, and they and Green Mountain Power have voluntarily collaborated their marketing, integrating their retail marketing efforts whenever possible. Both PGE and Pacific Power allow customers to sign up for all of the green power products directly on their websites or by directly calling the utility.

As of fall 2002, both utilities had enrolled about 1.8 percent of their customers. More impressively, the number of customers enrolled in green power programs tripled in the first six months after the utilities began providing new product options in March 2002. (Hinckley 2002) The success of the partnership between the utilities and a third party provider suggests that such relationships can significantly improve green power program participation rates. Allowing customers to enroll by directly contacting their utility also increases the ease of participation and can enhance participation rates, particularly if customers tend to hold a positive view of their utility.[11]

A shortcoming of the Oregon utilities' green power programs is the lack of clear and consistent product labeling standards. Green-e certified products in other states are bound by strict labeling requirements, which allows a clear head-to-head comparison of the options that are offered to customers. Such a comparison is lacking on the company websites, though PGE's website provides substantially more information than does Pacific Power's. Without the benefit of clear product information and head-to-head comparison, many customers will be challenged to make well-informed decisions. In Oregon, the Green Mountain product contains a far smaller portion of new wind generation, and the geothermal energy that dominates the product is generated out-of-state, in California. This information is readily available on the utility websites, but is likely to escape customer notice unless it is provided in a clear and straightforward product label.

[11] Studies have suggested that the success of green power programs is in part related to customer satisfaction with their utility.

Eugene Water and Electric Board

The Eugene (OR) Water and Electric Board's Windpower program is worth mentioning for its innovative approach of crediting customers with some of the hedge value of renewable generation. Customers can choose to purchase 10, 25, 50, or 100 percent of their electricity from a wind project in Wyoming. Separate from its Windpower program, the utility levies a per kilowatt-hour Power Cost Recovery Surcharge that varies depending on wholesale market prices. The Windpower program was designed so that this surcharge does not apply to the wind portion of a participating customer's electricity consumption, providing the customer with the rate stability benefit of his or her renewable power purchase, which is unaffected by fluctuations in wholesale market prices.[12]

This unique rate stability feature, combined with the high visibility of the program and its relatively long history (the program was begun in 1999), has enabled the Windpower program to achieve an unusually high customer participation rate of over three percent. (WUTC 2002)

Lessons Learned from Other States

Green power programs elsewhere in the country provide Connecticut with a variety of different models for the design, marketing, and implementation of Alternative TSO. Some of the lessons that may be learned from the experience of other green marketing and pricing programs are described below.

Product Content and Pricing

The variety of renewable options reviewed in the short list of programs illustrates the vast range of product offerings that could contribute to Alternative TSO. If improving local air quality, fuel diversity, and electricity price stability are significant goals of Alternative TSO, then any products offered as part of Alternative TSO should be derived from renewable facilities based in Connecticut (or perhaps New England or the Northeast).

New renewable resources provide the greatest incremental benefit, and the effectiveness of any green power program will be ultimately determined by its ability to promote the development of new renewable projects. Thus, Alternative TSO should promote the development of new renewable products. However, there is a tradeoff between promoting new renewables and maintaining an affordable green power premium for customers.

Niagara Mohawk's GreenUp program and NYSEG's Catch the Wind program have both been able to offer quality products with high amounts of new wind generation at reasonable premiums. Community Energy's 100% New Wind Energy NiMo GreenUp product has a premium of 2 cents per kWh; its GreenUp New Wind Energy product in Massachusetts contains 50 percent new wind energy and 50 percent existing small hydro and yet has a higher premium of 2.4 cents per kWh. While this price differential may be

[12] The hedging and rate stability value of renewable resources is discussed in Section 2 of this report. See, also, Biewald 2003.

partly due to differences in the renewable energy markets in the two regions, the green power market in New York has also been buoyed by the use of clean energy funds.

The New York State Energy Research and Development Authority (NYSERDA) has used the state's modest renewable energy fund of about $14 million per year to provide incentives for the first large-scale wind projects in the state and to support selected green marketing programs. In November 2002, NYSERDA issued its second solicitation for green marketing programs, and awarded three contracts totaling $6.4 million to Community Energy, Inc., and Sterling Planet.[13] The payment levels are based on product specifications and performance targets, such as meeting a specified amount of kWh sales.

California and Rhode Island have also used clean energy funds to support green marketing programs, the former with mixed results. The California Energy Commission (CEC) paid green marketers, on a first-come basis, an initial credit of 1.5 cents/kWh and later lowered the credit to 1 cent/kWh as demand increased. At the peak of the market, electric suppliers were selling renewables to approximately 160,000 residential and 40,000 non-residential customers. (Wiser and Bolinger 2002) However, the CEC program did not differentiate between new and existing renewable sources and offered incentives to several cheaper products of questionable quality. The size of the credit was also at times sufficiently large to create a price-driven market rather than a value-driven one (i.e. with the credit, green power could be cheaper than conventionally generated electricity), and customers often switched to green power products without even being aware that their product mix contained renewable energy. (Wiser and Bolinger 2002)

Rhode Island and New York both learned from California's experience and used their funds to target superior products with higher percentages of new renewable resources and developed funding mechanisms to allow for sustainable pricing. New York's use of its renewable energy funds to support wind power development and green marketing programs provides an example of how such funds can be used to minimize the tradeoff between marketing high quality green power products and maintaining reasonable cost premiums. While issuing an RFP such as the NYSERDA solicitation typically provides financial incentives to some green marketers while excluding others, those green marketers not receiving awards can still participate in green power programs. Green Mountain Energy and EnviroGen did not receive contract awards in the latest round of NYSERDA funding, but still offer competitively priced products in the NiMo GreenUp program. However, it is possible that whatever competitive advantages Community Energy and Sterling Planet have obtained through NYSERDA funding have yet to manifest themselves.

The Massachusetts GreenUp program may be especially relevant to Connecticut, given the physical proximity and the similarity between electricity markets of the two states. However, the GreenUp products are marked by a high percentage of small hydro generation and a relatively small amount of new renewable generation. While environmentally superior products may not be readily procurable in the current renewable market in New England, the implementation of the renewable portfolio standards in

[13] See the list of NYSERDA's recently signed contracts, available at www.nyserda.org/contracts.html.

Massachusetts and Connecticut should spur the development of new projects and improve the environmental quality of the products that can be offered in Alternative TSO.

Electricity Distributor and Green Power Marketer Partnerships

The experience of the Oregon green power program suggests that partnerships between utilities or default providers and green power marketers can enhance the success of the program. This is particularly true if customers are satisfied with their default electric distributor, as the distributor's name adds credibility to the green power offerings. Collaborative marketing can also increase the visibility of a green power program and increase the number of marketing channels.

An arrangement in which program revenues are used to offset the administrative and marketing costs of the TSO provider could lead to higher product costs, as evidenced by the NYSEG Catch the Wind program. Other utilities and electric distributors have managed to recover their costs through grants from clean energy funds and other organizations.

Enhancing Ease of Participation

To maximize customer participation, it is essential to allow customers to enroll in green power programs by directly contacting their current electricity service provider in addition to contacting the green power provider. Default or standard offer providers should also train customer service representatives to be knowledgeable about green power products. Customers may feel more comfortable signing up for a green power product from a third party vendor if they receive assurance that their current electricity supplier has some hand in administering the customer service aspects of the program. Default or standard offer providers have the most direct access to their electricity customers and should be required to have at least some marketing and customer education responsibilities. It is doubtful that annual bill inserts and website links provide sufficient promotion of green power programs. Rather, evidence suggests that more aggressive marketing strategies, such as direct phone calls, can enhance customer participation rates.[14]

Product Labeling

Most customers lack sophisticated knowledge of renewable energy and may be confused by the variety of green power products that may be available to them. Thus, clear and uniform product labeling is of the utmost importance. Fortunately, there already exists a Green-e standard in New England, which should facilitate product comparison and disclosure. A disclosure statement similar to that used in New England states for the source mix and emissions of retail offerings may be helpful. Even so, regulators should exercise caution to ensure that customers are equipped with the unbiased and clearly presented information they need to make well-informed green power product choices.

The more choices that a customer has, the greater the potential for confusion. The high number of GreenUp products being offered to Massachusetts Electric and Nantucket

[14] Wiser, et al., October 2001, op cit.

Electric customers poses a potential challenge in this regard, and it will be instructive to see how customers respond.

Non-Environmental Benefits of Green Power

The Eugene Water and Electric Board's Windpower program provides an outstanding example of an innovative approach to transferring the non-environmental benefits of renewable energy to participating customers. In New England, where wholesale market price volatility is clearly an issue, customers who purchase the attributes of renewable generation should be allowed to benefit from the price stability that renewable energy offers. Including this feature into the design of Alternative TSO will increase its attractiveness to customers while establishing an innovative model for green marketing in restructured electricity markets.[15]

3.3 Options for Renewable Energy Offers

A number of options exist for structuring an Alternative TSO based on renewable energy. These products might vary along dimensions of

(1) product content, including type and location of generation included in the offer,

(2) product design, including proportion of the customer's use that is provided by renewable energy,

(3) pricing and term of the offer, and

(4) program marketing and implementation.

Product Content

Renewable generation product offers may be characterized in terms of the source technology and vintage. These factors may be determined in advance by the Department's requirements for bidding, left to the discretion of bidders (and purchasers), or a combination of the two. A list of generation technologies that are included in Connecticut's statutory Class I and Class II definitions could serve as a minimum requirement, as could those eligible for Green-e certification. (See Appendix B for Green-e definitions.) Both limit recognition to certain technologies and establish whether or not generating sources must be "new."

One specific technology-based product is installation of photovoltaic panels at the customer's premises rather than providing renewable energy over the grid. This type of program has been offered in certain locations. While Connecticut may not be the best solar power location in the country, its strongly summer peaking loads, summer ozone concerns, and hot-weather transmission constraints make this an attractive option. Panels can be safely installed on the customer side of the meter using current technology and interconnection standards. Pricing is typically a set dollar amount per month per kW of installed panels. The solicitation should allow for such programs to be bid.

[15] The hedging and rate stability value of renewable resources is discussed in Section 2 of this report. See, also, Biewald 2003. Some options for program design along these lines are presented in Sec. 3.4, below.

In addition to the technology and vintage of units supplying power for a renewable generation offer, offers vary as to unit specificity. That is, some offers specify the output of a particular unit or fleet of units delivered to the control area serving the customer and for the purpose of doing so, while others offer only a commitment to acquire and retire tags or certificates bearing the renewable generation properties being offered. Thus, one program may promise to build a new wind turbine for every 1.5 MW of customer load signed up, while another may promise to purchase or otherwise acquire tags or certificates in the same quantity and certified to represent wind generation of new vintage, but not actually to build any units or take title to the output of any specific units. Both types of offer exist and can succeed. Both types can have similar ultimate impacts on the "on the ground" construction of new units. It is an open question how attractive a tag-based program will be to Connecticut customers, but some have been attractive elsewhere.[16]

Deliverability is that aspect of a renewable generation offer that specifies whether it is physically interconnected to the customer's control area grid or, even, the customer's own local T&D area. This can be an important issue for customers located in transmission constrained areas, such as southwest Connecticut, and for regulators concerned with reliability and the siting of potential generation and grid upgrades.

Product Design

Section 3.3, above, showed that a wide range of product designs have been used, including fixed block of power (e.g., a set amount of kWh per month), a percentage of the customer's use, or a contribution-based program.

One way product design alternatives vary is in terms of the risk they create for the vendor. Offering a fixed block of power is a less risky choice for the vendor than offering a percentage of the customer's use. If, for example, the offer is for 100 kWh per month to each participant, the vendor knows in advance exactly how much renewable power is needed and can contract for its precise needs (barring the small chance that some customers may use less than that amount on occasion). On the other hand, if the offer is for a set percentage of use, say 100% or 50%, the vendor must estimate customer usage and some true up mechanism may need to be included in the offer terms.[17] A contribution program may or may not have any significant vendor risk, depending on the terms and conditions.

From the customer's perspective, the various design options can vary in attractiveness. A fixed block product allows the participant to know in advance what the extra cost will be, as does a contribution based program. The percentage of use option will have a cost that can vary with the participants activity level, weather, and so on. This is not to suggest, however, that customers will necessarily prefer fixed block or contribution products over a percentage of use product. Some may relate strongly to the idea that, say, one-half or

---

[16] For an example of a certificate only program, the program description of Green Mountain Power's Cool Home Cool Planet program at https://www.greenmountainpower.biz/custcare/coolhome.shtml

[17] A tag- or certificate-based program would reduce this concern, so long as the usual grace period for true up is allowed.

even all of their usage is renewable. This can be a strong advertising claim for businesses or personally important to individual consumers.

Several other product design concepts are worth mentioning. They might be offered individually or in combination with each other or previously mentioned products. Solicitations should be structured to permit designs such as these, and the Department may wish to actively seek one or more of these proposals.

First, a product could offer delivery of non-emitting or closed carbon cycle generation. In other words, in return for a fixed payment the vendor would undertake to eliminate a certain amount of CO2 (X tons for $Y on each bill) through some appropriate means, such as constructing renewable generation or implementing energy efficiency. Customers could use this product, in essence, to purchase carbon offsets and make their own premises and energy use carbon neutral. (Customers might even choose to purchase additional offsets to cover their non-electric emissions.) Alternatively, the vendor could undertake to offset a certain percentage, possibly 100%, of customer's carbon emissions from electricity use for a premium of X mills/kWh. In its strongest form, offers of these types could result in a service that allows customers to become "zero net polluters," at least as to carbon and possibly other pollutants.

Second, special geographically targeted products could be offered to take advantage of higher locational marginal prices in, for example, southwest Connecticut. Such programs would naturally need to rely on distributed renewable generation located within the transmission constrained area. It would also be natural to combine such an offer with geographically targeted energy efficiency offers.

Third, the Department could consider a "clean energy" offer. This can be envisioned as a combined renewables and efficiency offer. The customer would pay an adder of X mills/kWh to reduce CO2 emissions from their own use by Z% through vendor's choice (or guaranteed combination) of, for example, (1) clean generation sources, such as non-emitting sources, closed carbon cycle biomass generation, or fuel cells, (2) high efficiency gas cogeneration offsetting other grid generation as well as non-electric fuel use, (3) onsite DSM, (4) other energy efficiency delivered in Connecticut or their own service territory, and (5) purchased and retired green tags or certificates.

Pricing and Term of Offer

While largely a matter for bid evaluation, two observations about pricing can be made.

First, it will likely be useful to structure the solicitation and bid evaluation so that consumers will ultimately be presented with several comparable products to choose from. Some utilities or competitive regimes have offered only one product, and some of these have had respectable participation. Offering only one renewable product could reduce the price premium through economies of scale, but so can competition among suppliers. Since the affected utilities in Connecticut are sizeable, it seems appropriate to rely on competition among suppliers to keep the premium small.

Second, it may be difficult to compare pricing across different product designs. Suppose one vendor offers to arrange the construction and operation of a new 1.5 MW wind turbine for each 1000 customers who sign up to pay a certain dollar contribution per

month, while a second offers a 100 kWh per month fixed block of wind power for a 2 cent/kWh premium, and third offers a 100% wind product covering the customer's entire usage at a premium of 2.1 cents per kWh. It is not immediately clear how to rank these products on price, either for purposes of bid selection or for ultimate consumers. One option would be estimate the per kWh cost to the participant for the renewable energy. The Department may wish to state in advance of the solicitation how bids will be compared on price (if that will be a selection criterion) and require that the necessary data or estimates be provided. Bid ranking should not be on price alone, however, as quality and variety in product design and content are also important to advancing the goals of the program.[18]

Duration of offers should be considered in bid selection, as well. Fixed block or percentage of use offers that make available long term fixed price (*not* fixed premium) renewable power would allow individual consumers to, for the first time, hedge their own electricity costs by purchasing power with long term insulation against market price fluctuations (aside from fluctuations in delivery charges). This could be a very powerful attraction for many. The optimum design might be an offer that entitles the consumer to a fixed price for power for some number of years, perhaps with an option to renew. This creates some downside risk for the vendor in the event that market prices decline significantly (since the vendor will likely have to lock in its price with its supplier either ahead of time or at nearly the same time as customers subscribe), but it should be possible for the vendors to hedge that risk, something that individual customers usually cannot do.

Marketing and Implementation

Successful marketing will depend on sound public education, credible offers and labeling, informed and professional responses to customer inquiries, and multiple avenues for inquiries and signup. At a minimum, offers should be advertised through bill inserts, public announcements in the media, and on the internet. Customer requests for service should be accepted via mail, phone, email and web sites, and via on-bill check off for both paper and internet billing situations. Validation of customer requests for service should be done in a manner comparable to that used for competitive retail service, especially for requests made by phone, internet and bill check off.

An open question is whether partial offers will be allowed and, if so, how they will be implemented. By partial offer, we mean, as discussed in greater detail above, an Alternative TSO where the supplier provides renewable generation products representing a fixed block or a percentage of use less than 100% of the participant's electricity use with the remainder provided by the default TSO or a competitive supplier. For purposes of these comments, we will consider implementation in the situation where the customer is taking service under a default TSO and wishes to convert all or part of that service to

[18] Here, and throughout this report, we assume that the Department's solicitation design and bid ranking process will address the full range of basic bidder qualification issues, such as the bidder's demonstrated capabilities and financial status, as well as reviewing bids for compliance with requirements and other fundamentals. This report's comments focus on those aspects of the anticipated program and bids that are unique to the Alternative TSO concept.

an Alternative TSO. The corresponding situation where the customer is taking service under a competitive retail offer is more complex, but can be considered separately if appropriate. The above review of options implicitly assumed that partial offers are permitted. In the situation where the remaining service is under a default TSO, this presents no particular product design problems, and implementation issues should be resolvable among the vendors and the distribution companies affected.

3.4 Recommended DPUC Action on Renewable Energy Offers

Neither the statute nor the DPUC Notice specifically address the question of which renewable technologies would be sought or allowed to be offered. This is a very important consumer issue for several reasons. Some consumers would want certain types of renewable energy and not others and would be disappointed if this information were not properly disclosed or if there were no choices on this dimension. Also, the DPUC needs to speak clearly on what technologies are permitted and on disclosure requirements.

In view of the range of product designs that have been implemented successfully in other states, we recommend that the Alternative TSO solicitation be open to all of the product designs discussed above, but indicate that offers that include an option for 100% renewable power will be given special consideration.

For a renewable generation Alternative TSO program to deliver actual benefits, whether in terms of sustainability, environmental protection, price stabilization, or economic development, eligibility must be defined so that only units contributing to those goals are eligible. This point would argue for a relatively tight definition of eligible technologies and a strong encouragement of new vintage sources. In order to promote the best combination of lower costs and environmental protection and to minimize customer confusion, we recommend that eligible technologies be limited to those that have Green-e certification *and* meet Connecticut's Class I or Class II definition. In addition, we recommend that either all or a substantial fraction of the generation offered be new in the sense of entering commercial service after the dates established in the Class I and II definitions, the Green-e standards, or the effective date of the Department's order in this proceeding. If older or less desirable technologies are included, it will be much harder for customers to distinguish between products that have a significant, positive environmental impact and those with marginal benefits at best. We recommend leaving open for bidders the question of unit-specific offers vs. tag-based offers. Deliverability requirements to specific sub-state areas may be of interest, given the constrained nature of some Connecticut transmission areas.

Clarity and prevention of questionable marketing claims is central to maintaining public confidence in the Alternative TSO program and the renewable energy industry. In that connection, standards or guidelines for marketing claims to customers should also be part of the program and solicitation. The most comprehensive guidelines of which we are aware of are the National Association of Attorneys General guidelines. (NAAG 1999)

4. Energy Efficiency Options and Recommendations

4.1 Rationale for Electricity-reduction TSO Alternatives

Public Act 03-135 encourages the Department to consider a TSO "option that utilizes strategies or technologies that reduce the overall consumption of electricity of the customer." There are several reasons for the Department to establish alternative TSOs that use energy efficiency and other load-reducing options to provide part or all of participating customers' energy services:

- The public strongly supports increased energy efficiency, as evidenced by the strong demand for the utilities' existing programs and by statutory provisions for funding energy efficiency in Connecticut, Massachusetts, Rhode Island, New York, Vermont, Maine, New Jersey and elsewhere.
- There exists a large economically achievable potential for electricity savings from conservation and load-management (C&LM) investments, particularly energy-efficiency resources. This conclusion is supported by a growing body of evidence, including recent studies of efficiency potential completed in Massachusetts, New York, Vermont, California, Oregon and the Southwest United States. (Fitchburg, et al., 2001; Plunkett, et al., 2003; Plunkett, et al., 2003a; LaCapra Associates 2003; SWEEP 2002; Borelli, et al., 2003; Rufo and Coito 2002) We understand that the study of Connecticut efficiency potential currently being prepared for the Energy Conservation Management Board (ECMB) is expected to find significant potential.
- Connecticut's recent energy-efficiency efforts have been limited by budget constraints.[19] There is significant unmet demand for the existing energy-efficiency programs.[20] The reduction in energy-efficiency budgets to offset state budget shortfalls will increase the level of unmet demand. The upcoming November filing of the 2004 C&LM program plans will contain numerous cuts in previously-planned programs, ranging from elimination of entire programs to scaling back on customer participation and/or market penetration of high-efficiency technologies.
- Energy efficiency is generally the lowest-cost resource available to the regional energy system. Pursuit of these cost-effective resources directly stimulates Connecticut's economy by putting more money in the pockets of consumers and businesses, who in turn spend or reinvest the proceeds of their electricity bill reductions.

---

[19] See the utilities' quarterly Conservation and Load Management Status Reports (Docket No. 99-09-30), including: CL&P First, Second, and Third Quarter 2001 Status Reports, Attachment B; United Illuminating Second Quarter 2001 Status Report to the ECMB, August 14 2001, at 2.

[20] See footnote 4, supra.

- Increasing energy efficiency reduces the direct costs of electric energy generation, the environmental effects of operating generation plants, the market price for energy (particularly in a transmission-constrained area) and the market power of the dominant owners of regional generation.
- Energy efficiency reduces power flows on the transmission and distribution system, and hence losses of energy and capacity.
- Energy efficiency in an area with distribution or transmission constraints reduces or defers the need for expensive upgrades to the distribution and transmission systems, as well as the environmental damages from the construction of those facilities.

4.2 Energy Efficiency Options in Other States

Optional energy efficiency tariffs and standard service offerings are uncommon to date. In most states, the standard generation-supply offer was conceived as a relatively short-term option for the minority of customers who would not bother to choose a supplier (or who were abandoned by a supplier), rather than a multi-year supply for the vast majority of customers. One time-of-use option that has been made available under a retail choice regime may offer some guidance.

Oregon's restructuring legislation requires the state's two investor-owned utilities, Portland General Electric (PGE) and Pacific Power, to offer market-based electricity options to its residential and small business customers. As a result, both utilities offer time-of-use pricing to customers. Time-of-use pricing is divided into three different price categories: on peak, mid-peak, and off-peak. Pacific Power's time of use option also provides different rates in summer and winter months. PGE's option provides different definitions of on-peak and mid-peak time periods in the summer and winter.

Both utilities assess a monthly meter charge for the cost of installing a special single-phase meter. PGE adds $2.00 to monthly residential bills, and Pacific Power adds a $1.50 monthly charge. PGE also requires a minimum enrollment period of one year. Pacific Power, on the other hand, offers a guarantee payment for the first 12 months that a customer is enrolled in time-of-use. If the customer's total annual energy costs under the time-of-use option exceed what their costs would have been under basic service by over ten percent, any excess charges over ten percent will be credited to the customer. If a customer terminates time of use service before a year is up, he or she forfeits eligibility for the guarantee payment.

The design of time-of-use rates should consider such issues as the selection of metering, the recovery of metering and billing costs, time-differentiation of distribution and transmission costs, and choices between fixed prices in fixed rating periods, real-time pricing, and various intermediate options (such as fixed price levels applied according to system load or market price). This suite of issues goes far beyond the scope of the current proceeding. Yet the use of time-differentiated rates for power supply can provide important incentives for shifting loads and making the usage of high-cost loads more efficient. United Illuminating is already offering residential customers the opportunity to take advantage of time-of-use pricing through their Rate RT program. The Department

should initiate an investigation of the opportunities for expansion of time-differentiated rates to address power supply, transmission, and distribution cost issues, and should not approve any TSO contracts that would impede the transition of customers to a time-differentiated alternative.

4.3 Potential Roles for Energy Efficiency in the TSO

The product for a TSO based on energy efficiency can be designed in many ways, combining options along four dimensions: the units of the product (money or energy), the target of the energy efficiency (from the participating customer to anyone on the system), the acquisition and delivery mechanisms for the energy efficiency, and the scope of energy-reduction services offered.

Units of the Product

The energy-reduction TSO alternative could either guarantee the participating customers that a certain percentage of their energy use will be offset (or reduced) by energy-reduction investments, or that any extra payments they make will be used to fund conservation (in any of the ways described in the next section).

Targets of the Energy Efficiency Investments

The funds raised from participants in the energy-reduction TSO alternative may be used in a number of ways:

- For enhanced and prioritized energy reductions for (or the energy savings delivered to) the individual participant. This approach may be problematic, since many customers who would be inclined to opt for the energy-reduction TSO alternative may already be very efficient.
- For the group of customers on the energy-reduction TSO alternative as a whole, with the efficiency investment going first to the participants who present the greatest opportunity for cost-effective load reduction.
- For customers participating in an energy-reduction TSO alternative, with the recipients determined by location as well as the greatest opportunity for cost-effective efficiency investments. This approach would work especially well for delivery of expensive deep savings, such as optimization of cooling systems and resealing of ductwork, customer-side renewables (especially photovoltaics) and clean distributed generation. Each selected participant might receive (for example) a mix of enhanced energy-efficiency services, rooftop photovoltaics, and microturbines. This approach is attractive for load-reduction options for which each installation typically costs more than an individual customer is likely to be willing to pay for alternative TSO, since it allows many customers to pool their willingness-to-pay and satisfy their desire to encourage efficiency, while offering some chance that each participant will directly receive the load-reducing investments

- To enhance or expand energy-reduction programs in the participant's rate class, or in the participant's transmission area. The latter option would give each participant some assurance that the extra TSO expenditure would be likely to reduce loads on local T&D equipment, improving the customer's reliability and reducing the likelihood of disruptive construction of additional transmission and distribution equipment.
- To enhance or expand energy-reduction programs in targeted groups, such as low-income residential customers, state and municipal facilities (which may be particularly popular for customers in financially-pinched municipalities) or non-profit institutions.
- To enhance or expand energy-reduction programs in targeted areas, specifically southwest Connecticut and loads on heavily loaded substations. This option may be combined with other targeting priorities, including low-income customers, transmission region, and rate class, although the programs may be constrained by these additional requirements.
- To enhance or expand energy-reduction programs across the utility system.

In any case, the attractiveness of energy-reduction TSO alternatives, especially those involving installation of equipment other than at the participants' premises, may be increased by allowing participating customers to advertise the benefits of their power supply, as with window stickers and an "Energy-saver" logo that can be used in advertising. The participants who receive the energy efficiency investments, especially commercial customers, may also find attractive a plaque indicating the participation in the program.

Acquisition Mechanisms

Whatever energy efficiency is funded under an alternative TSO can be acquired in a number of ways:

- Increased funding of existing programs under the conservation charge to increase the number of participants.
- Enhancement of the existing conservation programs, as by adding measures or other features.
- Competitive procurement of efficiency services from large commercial and industrial (C&I) customers, through a solicitation for proposals for thorough and comprehensive load-reduction investments at customer premises. Such procurement could function as an enhancement or supplement of the existing ECMB-supervised custom retrofit program.

- Competitive procurement of efficiency services from a single vendor, for a specialized service that would not interfere with the efficacy of the existing programs.[21]
- Competitive procurement of efficiency services from multiple vendors, by class, region or market segment. This option would need to be implemented in a manner that would prevent each program from interfering with the other alternative TSO programs, as well as with existing programs. The programs could interfere through confusing consumers with overlapping marketing or by splitting markets in inefficient ways (such as performing only part of the appropriate retrofits or analyses in a customer visit).
- Finally, it is possible that a "no cost green power" offer could be successful. Under this concept, the vendor would provide efficiency measures directly installed on the customer's premises, but the customer would continue to pay for all (or some part) of the saved energy subject, of course, to verification. All of the resulting bill savings (whatever they turn out to be, depending upon the customer), would be used to fund renewable generation. Although the customer pays no additional cost for electricity, each monthly bill would include an estimate of the cumulative CO2 emissions saved by the customer's part. It would be necessary to ensure that any such offsets are not reused for any other purpose or program, particularly to ensure that they are not claimed by sold to a third party or used to satisfy an offset requirement or RPS by a third party.

Scope of Program

An efficiency-reduction TSO may be limited to improvements in the efficiency of consumer use of electricity. It may also include funding of:

- Efficiency investments on the utility's side of the meter (e.g., low-loss transformers).
- Conversion of electric loads to other energy forms (particularly gas), especially where that conversion would relieve transmission and distribution constraints and reduce total energy costs. These conversions could include both heating load on winter-peaking substations and feeders and cooling load on constrained summer-peaking areas, especially southwest Connecticut. The electric and gas utilities should determine whether such conversions would exceed the capacity of existing gas transmission and distribution systems. In general, end-use gas conversions would tend to use less gas than would be used in power plants to serve the same end-use on electricity, so the effect of the conversions is likely to be beneficial on

[21] For example, a specialized service that undertook half the measures included in a more comprehensive, but currently underfunded, existing program, could result in a large number of customers who had received only some of the services of the main program. The overheads of including these customers in the comprehensive program may be just as high as for other participants, but the remaining savings of the program are likely to be much smaller. A small-commercial program that only addressed lighting might leave behind HVAC and refrigeration savings, which would require another set of customer contacts and site visits to implement.

the gas system (at least at the transmission level) as well as the on the electric system.

- Installation of on-site renewable generation, particularly photovoltaics. If the generation is on the customer's side of the meter, on-site generation would provide the "reduction of consumption" suggested by Public Act 03-135.
- Installation of clean, efficient on-site generation, including cogeneration, using microturbines, fuel cells and other technologies. Focusing of this distributed generation in southwest Connecticut could have several beneficial effects:
    - The transmission constraints would be ameliorated, as by any load reduction, increasing reliability, reducing equipment overloads and potentially delaying expensive upgrades.
    - Locational marginal energy prices would decrease, especially if the generation were dispatchable at the request of the ISO. The energy (and other) revenues from the generators could be used to offset the capital costs of the program.
    - Heavily loaded distribution equipment would experience lighter loads, extending the life of equipment and allowing existing equipment to satisfy load longer.
    - Line losses would decrease.
    - The generation could be configured to provide backup power to the host customer in the event of an outage, improving reliability and/or replacing (generally more-polluting) back-up generation that the customer would otherwise install or retain.
    - Depending on the type of generation and its installation, the generation may also improve power quality to the customer.

4.4 Recommendations for DPUC Action on Energy Efficiency Alternative TSOs

The Department should select a small number of energy efficiency Alternative TSOs that combine high efficiency in acquisition of load reductions, the ability to promote novel technologies, and at least one option that increases the participating customer's chance of receiving some credits for load reductions.

The most cost-effective use of additional funds raised from the energy efficiency Alternative TSO would be to increase the funding of the existing ECMB-supervised energy-efficiency programs. To ensure the participants in the alternative TSO that their contributions are producing energy savings, the funds from the Alternative TSO should be segregated and tracked separately from the funds raised through the mandated energy-efficiency charge.

This option also minimizes the administrative cost for the utilities and the Department, since the ECMB can oversee the spending of these funds. This approach would be

efficient and low in risk. A surcharge of $5/MWh on the TSO rate would be sufficient to fund load reductions offsetting about half of the customer's energy usage, assuming an average of $10 investment per conserved MWh. The following table shows the costs of the Connecticut statewide programs.

Table 4.1 Cost of Connecticut Statewide Electric Efficiency Programs[22]

	Spending ($M)	Lifetime Savings (MWh)	Investment per conserved MWh	
2003	$3.3 M	288,705	$11.4/MWh	Planned
2002	$4.9 M	491,381	$10.0/MWh	Actual
2001	$6.4 M	729,764	$8.8/MWh	Actual
Average			$10.1/MWh	
2003-01 increment	$3.1 M	441,059	$7.1/MWh	

A second, more innovative approach would pool funds from the participating customers to fund dramatic load reductions at some of their sites, with priority given to customers in southwest Connecticut and those on heavily-loaded feeders and substations. Those services could include more intensive energy-efficiency services, fuel-switching, photovoltaics and clean distributed generation. Bidders should be evaluated on the basis of the thoroughness of their proposed analyses and the comprehensiveness of their proposed services. Different bidders may be appropriate for different rate classes.

5. Recommendations for Assurance of Contract Performance

The act authorizing Alternative TSO, PA 03-135, Sec. 4, adds to the statutes the following provisions:

[22] From Comparison of CL&P Conservation Program for 2003 Revised 2/3/2003; Comparison of UI Conservation Programs for 2003—Optional Plan Reallocation Revised 4/8/03; The Connecticut Light and Power Company Conservation and Load Management Fourth Quarter 2002 Status Report, Year-to-Date Versus Annual Goals (Docket No. 99-09-30, Compliance Order No. 8, Attachment B), filed January 31, 2003; The Connecticut Light and Power Company Conservation and Load Management Fourth Quarter 2001 Status Report, Year-end Versus Annual Goals (Docket No. 99-09-30, Compliance Order No. 8, Attachment B), filed February 15, 2002; Comparison of CL&P Conservation Programs for 2002; The United Illuminating Company Conservation & Load Management Program Year 2001 Fourth Quarter Report, February 22, 2002; Comparison of UI Conservation Programs for 2002; and supporting work papers

(3) The department may require an electric supplier to provide forms of assurance to satisfy the department that the contracts resulting from the bidding process will be fulfilled.

(4) An electric supplier who fails to fulfill its contractual obligations resulting from this subdivision shall be subject to civil penalties, in accordance with the provisions of section 16-41, or the suspension or revocation of such supplier's license or a prohibition on the acceptance of new customers, following a hearing that is conducted as a contested case, in accordance with the provisions of chapter 54.

In its Notice of September 19, 2003, the Department requested comment on the question of, "What form or forms of assurance should the Department require to satisfy the Department that contracts resulting from the bidding process are fulfilled?"

Broadly speaking, the potential forms of assurance fall into four main categories:

- Warranties, parent company guarantees and other binding commitments;
- Prior evaluation of bidder's corporate capacity, managerial, organizational and financial, to perform;
- Prior evaluation of the fitness of the bidder's program plans; and
- Financial guarantees via bonds, letters of credit or other instruments.

The Department should consider each of these, but tightly limit any reliance on the last of these options. It is, of course, reasonable for the Department to require bidders to provide binding commitments to perform according to the terms of any proposals that they submit, preferably on the record in a formal proceeding with notice that the Department will explicitly rely on those commitments. This will be particularly useful in conjunction with the provisions of subdivision (3) quoted above.

Prior evaluation of corporate capacity should include review of business plans, finances, prior experience and track record, and internal controls. Evaluation of program plans for efficiency and other load-reduction offers should examine staffing resources and training, contractual arrangements with efficiency measure vendors and installers, screening tools and measure selection protocols, quality control and commissioning protocols, and other aspects of the proposed program and its proposed implementation.[23] In the case of renewable generation offers, critical items for evaluation include contractual arrangements for renewable generation or TRCs and the viability of those projects underlying the offer. The Department should consider both levels of evaluation.

Performance bonds, letters of credit or other instruments can provide some assurance that contracts will be satisfied, but add to the cost of service provision. Such requirements should be used with caution. If the Department intends to consider requiring bonds or similar instruments it would be most appropriate to do so only for the limited purpose of

[23] For existing efficiency programs supervised by the ECMB, the Department can defer the review of capability, design, and so on to the ECMB.

protecting specific customers from poor performance or failure to carry out commitments in the actual implementation of on-site energy-reduction measures and warranty compliance for failure of installed measures. The potential for cost increases does not seem justified to gain assurance of other aspects of performance such as ongoing availability of the vendor to serve future customers, due to the inherently incremental and modular nature of efficiency services. Such instruments could also be considered for renewable generation offers for the limited purpose of securing the default service provider against failure to deliver power for some limited period of time (to allow the default service provider or other Alternative TSO suppliers to make reasonable arrangements for replacement power). It might be appropriate to require some security to protect renewable energy generators against failure to be paid for power delivered to the Alternative TSO supplier and other commitments made, but we recommend, instead, that this concern be addressed contractually between Alternative TSO bidders and their suppliers with the Department reviewing the adequacy of those arrangements as part if its bid evaluation.

6. Conclusion and Recommendations

Alternative TSOs for renewable generation and energy efficiency can be beneficial for both participants and non-participants. Besides improving market stability and efficiency for all customers, they can reduce environmental impacts of many kinds. Alternative TSOs for efficiency also have the potential to also reduce customer bills. A number of design issues and public policy goals should be advanced in order to ensure that benefits are maximized and negative side effects minimized.

As authorized by PA 03-135, the Department should require the affected utilities to procure a variety of renewable generation and energy efficiency Alternative TSOs as described above. In doing so, the Department should take into account the following specific recommendations.

1. To ensure that customers are receiving a fair value for their green power product and to ensure a competitive environment for green power providers, customers should be able to choose from several different green power providers. Evaluation of bids should result in at least a few options for customers to choose from, so long as a sufficient number of appropriate offers are received.
2. Procurement of energy efficiency offers should be structured to permit and facilitate optional time-of-use rates.
3. Procurement requirements should solicit offer structures that will provide customers with some guarantee of price stability, but should not mandate any specific form of guarantee. Rather, the guarantees offered, if any, should be factored into the evaluation of bids.
4. Offers that deliver to customers the hedge value of renewables should be considered favorably.

5. Bids should be required to facilitate customer participation in green power programs by providing multiple enrollment opportunities, including at least phone, mail, and Internet enrollment.

6. Bids should be required to provide that customer service representatives be trained to understand the product offerings and clearly articulate their benefits to customers.

7. Procurement should discourage or prohibit imposing contractual requirements on customers participating in renewable generation alternatives unless there is a substantial investment in generating equipment on the customer's premises.

8. Energy efficiency alternatives making extensive investments on customer premises should be permitted to require reasonable, Department-approved minimum participation periods. Other contractual requirements specifically relevant to investments made or savings guaranteed may be considered for Department approval.

9. Neither renewable energy nor energy efficiency alternative TSOs should be allowed to include mandatory purchase of any other product or service of any kind. Two possible exceptions should be considered on a case-by-case basis, subject to verification that they do not involve improper "tie-ins." These possible exceptions, depending on the situation, might be (i) maintenance service for specialized equipment, where that service is not commonly available commercially, and (ii) specialized services or the provision of equipment which itself comprises the Alternative TSO proposed in the bid.

10. Specific marketing to non-residential markets should be encouraged and evaluated in bid selection.

11. Procurement should encourage programs to allow customers to sign up by directly contacting their electricity supplier (default or otherwise) and distribution company to enhance the ease of participation and potentially to increase participation rates. The Department should require affected distribution companies to support this means of enrollment. It may be appropriate to place a similar requirement on competitive electricity suppliers, but this is beyond the scope of our comments.

12. Integration of billing (provision of a single bill for distribution, TSO and alternative TSO service) should be strongly encouraged or perhaps required in bid evaluation.[24] Distribution companies should be required to cooperate in this process.

13. Initial procurement should be for programs that would continue to be offered for at least two years in order to encourage bidding and provide a reasonably stable platform for planning and power procurement. Longer periods should be encouraged. However, this should be subject to two provisos. First, each offer should be subject to a process and performance evaluation at the end of the first year and periodically thereafter. Offers that do not meet DPUC standards, do not comply with accepted bid provisions and procurement requirements, or are providing inadequate customer service should be subject to termination. Second, based on evaluation experience, the

[24] See Appendix A to this report, item 14 for possible exceptions.

DPUC should reserve the option to order additional procurement on new terms and authorize implementation of new, additional offers from that procurement without prejudice to previously approved offers not terminated by the Department.

14. Clear, uniform labeling and disclosure of renewable content, energy efficiency to be provided, and price and terms should be required of all offers. For renewable offers, existing disclosure labeling and programs such as Green-e may be looked to for models. Standardizing labeling and disclosure requirements for efficiency offerings is likely to be complex and may need to wait for further experience; if so, bidders should be required to propose explicit and binding labeling and disclosure commitments, which should be evaluated in the selection process.
15. The Department should consider an independent public education campaign to precede and accompany Alternative TSO offers.
16. Procurement should encourage and favor methods for transferring the non-environmental benefits of renewable energy, such as their hedging value, to participating customers.
17. Procurement should encourage the targeting of specific programs to Southwestern Connecticut to alleviate the transmission crisis in that area.

References

Biewald, Bruce, Tim Woolf, Amy Roschelle, and William Steinhurst 2003. *Portfolio Management: How to Procure Electricity Resources to Provide Reliable, Low-Cost, and Efficient Electricity Services to All Retail Customers*. Synapse Energy Economics. Prepared for the Regulatory Assistance Project.

Bolinger, Mark, Ryan Wiser and William Golove 2002. *Quantifying the Value that Wind Power Provides as a Hedge against Volatile Natural Gas Prices*. Environmental Energy Technologies Division, Ernest Orlando Lawrence Berkeley National Laboratory, June. Available at <http://eetd.lbl.gov/EA/EMP>.

Borrelli, Shelly, David Baylon, Neal Elliott, Anna Shipley, Steve Nadel, Harvey Sachs, Elizabeth Brown, David von Hippel, Alison Bailie, Michael Lazarus 2003. *Energy Efficiency and Conservation Measure Resource Assessment for the Residential, Commercial, Industrial and Agricultural Sectors*. January. Prepared for: Energy Trust of Oregon, Inc. See http://www.energytrust.org/.

Connecticut Department of Environmental Protection (CT DEP) 2002. www.dep.state.ct.us/air2/attain2.htm. August 16.

Connecticut Global Fuel Cell Center (CT GFCC) 2003. www.ctfuelcell.uconn.edu/.

Energy Conservation Management Board 2003. *Energy Efficiency: Investing in Connecticut's Future.* January 31. Available at: http://www.dpuc.state.ct.us/Electric.nsf/ByECMB?OpenView&Start=1&Count=30&Expand=6#6

EIA 2002. *Impacts of a 10-Percent Renewable Portfolio Standard*. February.

Hinckley, Thor 2002. *Collaborative Marketing: Utilities and Energy Marketers Working Together*, presented at the Seventh National Green Marketing Conference, October 14.

LaCapra Associates 2003. *VELCo Northwest Vermont Reliability Project—Assessment of Economically Deliverable Transmission Capacity From Targeted Energy-Efficiency Investments in the Inner and Metro-Area and Northwest and Northwest/Central Load Zones.* Final Report April. See: http://www.nrpvt.com.

Nadel, Steven, Fred Gorden and Chris Neme 2000. *Using Targeted Energy Efficiency Programs to Reduce Peak Electrical Demand and Address Electric System Reliability Problems*, American Council for an Energy Efficient Economy (ACEEE), November.

National Association of Attorneys General Environmental Marketing Subcommittee of the Energy Deregulation Working Group (NAAG) 1999. Environmental Marketing Guidelines for Electricity. See: www.naag.org/issues/pdf/Green_Marketing_guidelines.pdf

Plunkett, John, Philip Mosenthal, Steven Nadel, R. Neal Elliott, David Hill, Chris Neme, and Christine Donovan 2003. *Energy Efficiency and Renewable Energy Resource Development Potential in New York State*. Final Report August 2003. Prepared for: New York State Energy Research and Development Authority, See: www.nyserda.org/EE&ERpotentialVolume1.pdf.

-----, Phil Mosenthal, Chris Neme 2003a. *Electric and Economic Impacts of Maximum Achievable Statewide Efficiency Savings 2003-2012*. Public Review Draft of January 21. Prepared for Vermont Department of Public Service. See: http://www.state.vt.us/psd/index.htm.

Rufo, Michael, and Fred Coito 2002. *California's Secret Energy Surplus: The Potential for Energy Efficiency*. Final Report September 23. Prepared for The Energy Foundation and The Hewlett Foundation. See: http://www.ef.org/documents/Secret_Surplus.pdf.

Southwest Energy Efficiency Project (SWEEP) 2002. *The New Mother Lode: The Potential for Energy Efficiency in the Southwest*. November. Prepared for: Hewlett Foundation. See: http://www.ef.org/energyseries_secret.cfm.

Swezey, Blair 2002. *Introduction to Regional Green Power Market Reports,* presented at the Seventh National Green Power Marketing Conference, October.

-----, and Lori Bird. 2001. *Utility Green-Pricing Programs: What Defines Success?* National Renewable Energy Laboratory, September.

(US) Department of Energy, Office of Energy Efficiency and Renewable Energy (EERE). *Quick Facts about Wind Energy*. http://www.eere.energy.gov/wind/web.html

Wiser, Ryan, and Mark Bolinger 2002. *Using Customer Credits to Stimulate Green Power Sales in California, Rhode Island, and New York,* part of the Berkeley Lab and Clean Energy Group Case Studies of Support for Renewable Energy, September.

-----, Mark Bolinger, and Edward Holt. 2000. "Customer Choice and Green Power Marketing: A Critical Review and Analysis of Experience to Date." *Proceedings of the 2000 ACEEE's Summer Study on Energy Efficiency in Buildings.* ACEEE August.

-----, Mark Bolinger, Edward Holt, and Blair Swezey 2001. *Forecasting the Growth of Green Power Markets in the United States*, National Renewable Energy Laboratory, October.

Washington Utilities and Transportation Commission (WUTC) 2002. *Green Power Programs in Washington: A Report to the Legislature*, December.

Woolf, Tim, David White, Cliff Chen, and Anna Sommer 2003. Potential Cost Impacts of *A Vermont Renewable Portfolio Standard*. Synapse Energy Economics. Prepared for the Vermont Public Service Board. October.

Appendix A: Comments on DPUC Principles and Questions

A. Power Procurement Principles

1. Procurement process must be fair and impartial to all participants.

It might seem that no discussion of this principle is needed, but it may be worth pointing out that such fairness is essential to ensure participation by the maximum number of bidders. This concern clearly arises where affiliates of the procurement manager might be bidding, and must be alleviated to assure potential bidders that their bids and their program offerings will be able to compete on a level playing field with other bidders. The DPUC should consider mandating such specific procurement procedures as it finds necessary to guarantee not only substantive fairness, but also perceived fairness. See, also, response to item A.3 below.

2. Codes of Conduct for electric distribution companies must be strictly observed if a generation entity that is an affiliate participates in the transaction. It is imperative that generation procurement be conducted in a manner that does not provide any unfair competitive advantage to a power supplier by virtue of its association with the electric distribution company.

This principle is a necessary companion to the first. Its importance was stressed by the OCC in its comments dated August 11, 2003, filed in Docket No. 03-07-18. The Department may wish to consider requiring compliance with appropriate elements of such a Code even if the procurement manager is not engaged in the provision of competitive retail electricity . That requirement could be important, for example, in situations where the procurement manager for an efficiency Alternate TSO is a wires-only distribution company whose transmission and distribution revenues (and margins) depend on the volume of power consumed under TSO. It could also be relevant for renewable energy offers under Alternate TSO/SOS if the procurement manager is a wires-only distribution company whose transmission and distribution costs would be affected by the location at which renewable energy is delivered to the grid, for example by incurring additional interconnection costs.

3. As broad a group of potential bidders as is practicable must be notified and offered an opportunity to respond to the procurement inquiry or request.

As with item A.1, above, this seems an intuitively desirable requirement, but two points are worth making here. First, the larger the group of potential (and committed) bidders, the more competitive pressure there will be for them to enhance their bids and the more varied points of view and creative alternatives may be expected to be offered. Second, the Department should consider adopting specific notice requirements and procedures including, but not limited to, an electronic posting of solicitations on a site managed and promoted by the Department.

4. Procurement should be conducted in a manner to cost-effectively promote price consistency and stability and minimize revenue requirements.

In its August 11, 2003, comments in Docket No. 03-07-18, the OCC discussed the way in which the allocation of federally mandated congestion costs ("FMCC") to either TSO bidders or rate payers would advance or retard price stability and revenue requirements. In those comments, the OCC pointed out that some risk sharing might be in order and urging careful regulatory scrutiny of any distribution company decisions under these principles. Those comments remain relevant here.

To advance this principle most effectively, the RFP should encourage proposals that employ sound portfolio management principles. Both renewable generation (especially generation within congested areas) and energy efficiency procurement can contribute to price stability by mitigating wholesale market price volatility. (Biewald, et al., 2003) Energy efficiency offers can reduce the total revenue requirement for service if properly constructed. Thus, Alternative TSO procurement should emphasize in RFPs and any ranking procedures the manner in which offers will contribute toward reducing revenue requirements and the extent to which they may be expected to do so. Artificial requirements and constraints on portfolios used by Alternative TSO bids and offers should be avoided.

5. Complete, non-discriminatory and timely access to relevant data and information shall be provided in a manner designed to maximize the number of responses.

The response provided to items A.1 and A.3, above, also apply here. In addition, a means should be provided for potential bidders to request clarification or additional data, within reason, and the requests and responsive data should be made available on-line to all potential bidders. This could be done in a manner similar to that used in recent divestiture sales and auctions of nuclear assets, including Docket No. 99-09-12, as to Millstone, and Docket No. 00-12-13, as to Seabrook. Another example is the recent bidding of New Jersey's Basic Generation Service.

Further, it is vital to ensure not only fairness and impartiality in the procurement process, but also transparency in the decision-making regarding both the solicitation and the selection of vendors. The Department should require, and the Utility Operations and

Management Analysis (UOMA) team should verify, that all analysis, ranking and selection of bids is fully documented for subsequent review. While it will be necessary to ensure fairness among potential bidders by keeping their bids confidential from other potential bidders until the closing date of any solicitation, that requirement should not in general, apply thereafter. Even if certain, limited types of information in bids needs to be further protected from potential competitors, this should be minimized and the DPUC should always have complete access to all bid information and bid analysis. The goal should be the maximum feasible transparency in every aspect of the process.

6. The procurement process should seek to maximize the likelihood of operational reliability and safety in the provision of Alternative TSO.

Safety is a relevant concern for both installation of renewable generation (particularly if on customer premises in the form of cogeneration) and energy efficiency measures. However, it would not be appropriate for the Department or distribution utilities to impose burdensome requirements or requirements that are duplicative of existing codes and permitting process. In particular, distributed generation facilities should not be required to comply with standards different from the recently adopted IEEE interconnection standards.[25] Likewise, they should not be subject to unreasonable planning, engineering or other study requirements.

Operational reliability of renewable generation offers will depend on elements of risk in the bidder's portfolio, which RFPs should require to be described in any offers. Operational reliability of energy efficiency measures is a function of program delivery mechanisms for proper installation and commissioning, plus sound engineering estimation (grounded in relevant program evaluations of similar measures and programs). Explanation of these points, too, should be required by RFPs.

7. The procurement process should allow bidders and the electric distribution companies the maximum flexibility practicable in structuring bids and in requesting bids in order to maximize the value each bidder offers.

As with the principles addressing maximizing accessibility of the bidding process, maximum practical flexibility in submitting bids will contribute to the value and efficiency of the auction process. As the OCC stated in connection with TSO bidding, the DPUC should state that the distribution companies are required to obtain Alternative TSO power through competitive bidding activities fully consistent with those principles when it publishes these procurement principles in final form. (CT OCC 2003) It is not clear what kind of flexibility in the manner of distribution company procurement would be

[25] For a description of the standard, see www.nrel.gov/docs/fy03osti/34003.pdf

beneficial to this process, but it is clear that any lack of consistent adherence to the Department's principles and approved program requirements would be detrimental to the other principles discussed herein and the purposes of the Alternative TSO program itself.

8. What form or forms of assurance should the Department require to satisfy the Department that contracts resulting from the bidding process are fulfilled?

This principle is discussed in the body of this report for renewable generation and energy efficiency offers. See, also, comments on item A.6, above. Generally, bonds, letters of credit or other instruments can provide some assurance that contracts will be satisfied, but add to the cost of service provision. Such requirements should be used with caution.

9. What contract terms, including pricing and lengths and termination of the contract, should contracts between consumers and Alternative TSO electric suppliers contain?

Contracts between consumers and Alternative TSO electric suppliers should contain all the necessary provisions to determine unambiguously the exchange taking place, including price, duration, termination provisions, minimum and maximum purchases (if any), information that will be provided for verification of contract performance, and methods for providing such information and any notices that may be necessary. Energy efficiency contracts and certain types of renewable energy contracts (such as those providing for customer-sited generation) may also need to specify terms for physical access, responsibility for operation and maintenance, interconnection details, and warranties for equipment, output or savings. These and other terms are discussed in the body of this report.

10. Is it preferable to establish procedures in which Alternative TSO bids are accepted separately by CL&P and UI for Alternative TSO contracts in their respective service territories, or is it preferable for the companies to conduct a joint bidding procedure?

There are arguments for and against both positions. Joint bidding would tend to enhance 0the attractiveness of the RFP to potential bidders, to reduce administrative costs for the procurement and for marketing the offers, and to reduce customer confusion. Joint bidding may also lead to "group think," mixed messages to bidders, watering down of standards, difficulties in matching customer service, billing, and information systems, and slower decision processes. Separate bidding would allow for additional creativity, yardstick competition between the distribution companies, and might enhance buy-in by the distribution companies. On the whole, we recommend joint bidding, provided the

Department finds, after reviewing information provided by the relevant distribution companies, that joint bidding is feasible. It may be useful to seek specific information from them as to the relative ease or difficulty of their systems supporting a unified RFP and a common set of offers.

B. Alternative TSO Contract Terms

11. Should Alternative TSO electric service be supplied through the distribution company or by third party suppliers?

We are concerned that we may not understand the question. The relevant section of the Act (PA 03-135) calls for provision of Alternative TSO by "an electric distribution company . . . through an electric supplier or electric suppliers" and for the distribution companies to "conduct a bidding process in order to solicit electric suppliers to provide such alternative option or options." Thus, the relevant question would seem to be" may a distribution company bid in such a process?" Under Section 17(d) of PA 03-135, the answer is clearly no. This section provides that no distribution company may own, operate, lease or control any generation facility or retain any interest in such a facility. In addition, we further recommend that affiliates of distribution companies not be allowed to bid to provide Alternative TSO.

12. If Alternative TSO is supplied by a third party supplier, which of the following responsibilities should be performed by the third party supplier?

    A. Supplying green certificates but not delivery of green power itself,

    B. Delivery of actual bulk green power.

    C. All relevant retail responsibilities, including customer service in addition to the delivery of actual bulk green power.

As explained in the body of this report, renewable energy offers under an Alternative TSO could arguably be made with terms calling for the supply of "green certificates," delivery of actual bulk power, or a number of other alternatives. We recommend a procurement wherein bidders may propose a variety of arrangements along this spectrum.

In connection with this point, we would like to point out that there are two different ways of conceptualizing Alternative TSOs as they would actually operate. We see possible advantages to each and recommend that the DPUC structure any solicitations so that either approach or, possibly, some combination of them is eligible, reserving decisions about which way to go until after the bids are received.

The first overall model for an Alternative TSO is the "bundled" approach. By this we mean, that the Alternative TSO supplier delivers the entire TSO including both alternative services—whatever renewable energy and energy efficiency are part of the offer—and any remaining non-renewable generation service. Distribution service would continue to be provided by the existing distribution company.

The second overall model is the "add-on" approach. Under this model, participating customers remain TSO customers and continue to be eligible for that service under prevailing rates. The Alternative TSO supplier provides only such efficiency or renewable energy service as the participating customer elects. For renewable energy Alternative TSOs, this would often be done by purchasing and retiring RECs or by the contribution model discussed in the body of this report. For energy efficiency Alternative TSOs, this model leaves the Alternative TSO supplier free to concentrate on its core services. In the case of a renewable energy Alternative TSO (or a combined efficiency and renewable energy offer) that offers to meet 100% of the participant's electricity needs, it would be helpful to marketing and consumer confidence if such offers were treated as "add-on" offers.

The advantages of "add-on" model are (a) the customer never switches their generation supplier, and therefore can remain on TSO rates, (b) the TSO supplier may be best able to get good deals on power, while the Alternative TSO suppliers would focus on getting good deals on RECs and implementing cost-effective efficiency measures. In other words, each TSO or Alternative TSO provider could provide those services where they have the greatest experience and strength. Under this model, the renewable energy Alternative TSOs could offer a variety of renewable products, e.g., 25%, 50%, or 100%, renewable or various mixes of new and existing renewables. Customers could then chose among the Alternative TSOs based on the mix that they prefer as they can in GreenUp program operating in Massachusetts and Rhode Island.

On the other hand, some suppliers may have the resources to offer an Alternative TSO under the "bundled" approach and at an attractive price. This could be particularly interesting if the supplier has low cost non-renewable power to mix with renewable energy or efficiency.

Again, at this point, we recommend the DPUC ensure that any solicitation be structured so that bids following either model would be eligible.

As for the provision of customer service, our recommendations are different for energy efficiency and renewable energy offers. We understand "customer service" to mean billing, account creation, transfer and termination, dispute resolution, answering inquiries and problem resolution. Distribution companies should be required to provide such information and coordination as is reasonably necessary to enable marketing and implementation of approved offers.

With regard to energy efficiency offers, the bidder should be required to provide all customer service functions *with regard to the efficiency measures and services only*. The distribution company should continue customer services with regard to distribution and remaining power supply. An exception to this would be appropriate for energy efficiency offers where the vendor specifically proposes to engage in performance contracting with

the customer covering the customer's entire electric costs or offers that elect to follow the "bundled" model.

For renewable energy offers, the answer would depend on the type of offer. For offers following a "bundled" model, the supplier should provide all customer service functions, except with regard to distribution service. As to offers to provide a certain, set amount or percentage of renewable energy, the vendor should be required to provide customer service functions regarding any disputes or other needs *as to its commitment*, but not as to distribution service or any other power consumed. For offers to provide all power used by a consumer, the vendor should be responsible for all customer service functions except for distribution service. Lastly, for offers to provide renewable energy through customer site generation, the vendor should be responsible for customer service regarding all aspects of the generation, explicitly including interconnection with the distribution utility. (This is not to say that the vendor is necessarily the entity responsible for operation and maintenance of the equipment; that question should be answered by bidders.)

13. Should Alternative TSO be offered or marketed through a “check-off” mechanism on customer bills?

One option of this type would be a check-off that results in the provision of marketing information or a marketing contact. This would certainly be helpful to vendors and consumers and should be required. Another option is actual enrollment via a check-off. We do not recommend final completion of the enrollment process without provision of complete program information, an ability to ask questions, and verification. Omitting these steps from the enrollment process could lead to misunderstandings and disgruntled customers, especially if there are multiple offers. We recommend enrollment via a check-off only with precautions to ensure these requirements are met.

14. Should customers have the option to purchase Alternative TSO electric service in incremental units (e.g., 10%, 20%, etc. renewable energy), or should Alternative TSO be offered only as a 100% “green” product? If the incremental option is chosen, describe the major procedures that must be instituted for the distribution companies to bill for this service.

As explained in the body of this report, renewable energy offers under an Alternative TSO could arguably be made for fixed amounts of energy or capacity. They can also be made for varying percentages of actual use, including 100%. We recommend a procurement that allows bidders to propose a variety of arrangements along this spectrum. Selection should favor offers that allow customers to choose high percentages of their consumption from renewables, preferably with a large fraction of new generation.

The last part of this question seems to assume that distribution companies will be billing for the renewable power provided under such an offer. This may well be the case and would be attractive to many consumers. However, we recommend that any renewable energy procurement should not limit vendors' ability to propose offers that include billing separately for the renewable product in certain circumstances. For example, some renewable programs provide for purchasing and retiring a set number of certificates; this is a service type that could very well be billed easily and directly by the vendor on a credit card to the advantage of the consumer and the program. However, distribution companies should be required, if necessary, to provide industry standard metering information, receive standardized pricing information, and provide billing, collection, and funds transfer services to vendors.

15. Should Alternative TSO suppliers be identified by the name of the supplier in addition to the "green" attributes of the Alternative TSO product on the distribution companies' billing documents? Or should Alternative TSO products be described generically only in terms of their "green" attributes (i.e., not "branded" in any manner)?

In general, vendors will want at least the option of branding their service. It may be that some would be interested in simply delivering specified renewable or efficiency products to be sold by the distribution company, but we suspect this would be rare except for facility-based renewable energy developers.

16. Is the GIS (Generation Information System) procedure that the Department contemplates in its draft Renewable Portfolio Standards a sufficient vehicle to verify the "green" content of Alternative TSO electricity?

We understand this question to refer to the *DPUC Promulgation of Regulations for Renewable Energy Portfolio Requirements and Customer Disclosure*, issued in Docket No. 02-04-14 on December 18, 2002.

With regard to renewable generation Alternative TSOs, the GIS procedure appears adequate to verify offers that rely solely on renewable generation participating in the NEPOOL GIS or applying directly to the Department for certification. It is possible that, using the Department's proposed provision for certifying power imported under a bilateral contract (Sec 16-245a-1(b)(2)), generation could be certified by the Department for use in Connecticut and still be counted as part of a system average used to impute an import mix.

With regard to Alternative TSOs based in whole or in part on certification in a system other than the NEPOOL GIS, especially such a system that does not interconnect with New England or is operated by an entity that is not a Control Area, it will be necessary to carefully verify compliance with subdivision (C) of Sec. 16-245a-1(b)(2) of the regulation. Requiring Green-e certification would address this concern.

The GIS procedure contained in the Department's draft regulation does not address Alternative TSOs based on energy efficiency.

17. For each of the following renewable energy options offered in other states and/or service territories, comment on its favorable or unfavorable aspects, including whether it would comply with P.A. 03-135 §4(d).

    A. Niagara Mohawk Renewable Energy program (refer to the Niagara Mohawk website and New York Public Service Commission Case 01-M-0075).

    B. Washington State green power pricing product. (refer to Washington Utilities and Transportation Commission website, wutc.wa.gov.)

    C. Oregon renewable energy options. (refer to Oregon Public Utility Commission website, www.puc.state.or.us, or the Portland General Electric and Pacific Power websites.)

    D. Provide examples of favorable and unfavorable aspects of renewable energy options for electric customers in other states.

Please see sections 3.2 and 4.2 in the body of this report.

C. Alternative TSO Options That Promote Reduced Electric Consumption

18. The Department requests comments on the feasibility of the following options for Alternative TSO service options that, in accordance with PA 03-135 §(5)(d)(1), utilize strategies or technologies that reduce the overall consumption of electricity of the consumer:

    A. Pay-As-You-Go tariff option offered as part of the TSO electric service, which enables customers to pay for the front-end cost of electric efficiency investments by paying over time as part of their electric bill. The tariff would be collateralized by an approved competitive supplier that demonstrates financial assurance.

    B. Time-of-use tariff, either seasonal or time-of-day rates offered by competitive suppliers for customers.

    C. Market-based interruptible rates.

    D. Other market-based strategies or technologies.

Pay-As-You-Go efficiency offers (or "on bill financing") can contribute to a variety of the options described in the body of this report. Time-of-use tariffs and other alternatives are also discussed in the body of this report. Any solicitation should be open to Alternative TSOs that are, themselves, based on or include an interruptible rate so long as they are compatible with the ISO's demand response programs. In addition, we suggest that any solicitation encourage submission of Alternative TSOs bids, whether based on renewable generation or efficiency, that assist or enable customers to participate in the ISO-NE demand response program. Alternative TSO bids that made this possible for , small customers would be particularly valuable .

19. Please provide any other comments that are relevant and useful to this docket.

Please see discussion in the body of this report.

Appendix B: Green-e Standard

The following program description is from the Green-e web site at http://www.green-e.org/ipp/standard_for_marketers.html.

This is the Green-e Standard for Electricity Products in competitive markets in New England, New York, Mid Atlantic, Ohio, Texas, and California. To view the Green-e Standard for Tradable Renewable Certificates (TRCs), please see the TRC announcement. To view Green-e accreditation standards for green pricing programs in regulated markets please see the Green Pricing Accreditation Initiative.

I. Renewable Energy Content

In New England, New York, California, Ohio and the Mid Atlantic, retail electricity offerings or "electricity products" that serve 100% of a customer's load must contain at least 50% renewable energy based on the product supply mix and meet the New Renewable Energy Content requirements (see III below). Electricity products sold as block products must contain a minimum of 150 kWh/month of new renewable resources. In Texas retail electricity offerings that serve 100% of a customer's load must contain at least 50% new renewable electricity plus any state mandated RPS renewable amount. Electricity products sold as block products must be 100% new renewable in a minimum size of 200 kWh/month. Block product certification is only available for blocks sold to commercial customers.

II. Qualifying Sources of Renewable Generation

1. **Geothermal**
2. **Wind**
3. **Small & Low Impact Hydropower:**
   · The output is equal to or less than 30 megawatts; or
   · The facility is certified by the Low Impact Hydropower Institute

   These standards apply to all regions unless noted in the regional standards below.

   In New England and New York:
   Hydro facilities relicensed by FERC after 1986 also qualify. When the green power market reaches sufficient maturity Green-e's intent is to adopt LIHI certification as the sole standard in New England and New York. This decision shall be reviewed annually.

   In Ohio
   Hydro facilities whose output is equal to or less than 42 megawatts qualify. Starting 1/1/2005, eligible hydro resources for Green-e in Ohio will only include hydro facilities certified by LIHI.

4. **Solar Electric**

5. **Biomass:**
Solid, liquid and gaseous forms of biomass are eligible including:
· All woody waste including mill residues;
· All agricultural crops or waste;
· All animal and other organic waste;
· All energy crops; and
· Landfill gas.

These standards apply for all regions unless excluded in regional standards below. All regional standards exclude combustion of municipal solid waste.

The New England, New York, the Mid Atlantic, Texas, and Ohio Green-e standards exclude these woody biomass resources:
· Wood that has been coated with paints, plastics, or formica;
· Wood that has been treated for preservation with materials containing halogens, chlorine or halide compounds like CCA-treated materials, or arsenic (CCA = chromated copper arsenate);
· There may be deminimus quantities of qualified wood fuel (less than 1% of total wood fuel) that can contain the above excluded contaminates.

The Mid Atlantic Green-e standard also excludes:
· Herbaceous agricultural waste;
· Forestry biomass waste other then mill residues.

The Ohio Green-e standard:
Green-e will revisit the use of whole trees, tops, and logging slash as a biomass resource in 2003.

Biomass Emissions:
In New England and the Mid Atlantic:
The average weighted NO_x emissions from all biomass sources, except landfill gas or digester gas, that contribute to a specific Green-e product sold in New England or the Mid Atlantic shall not exceed:
· 2.9 lbs./MWh in 2000, 2001, 2002;
· 2.63 lbs./MWh in 2003, 2004, 2005; and
· 2.25 lbs./MWh in 2006, 2007, 2008.

In New York:
The average weighted NO_x emissions from all biomass sources, except landfill gas, that contribute power to a specific Green-e product sold in New York shall not exceed:
· 2.9 lbs./MWh in 2002, 2003, 2004; 2005;
Standard(s) for subsequent years are adopted here, but will be reviewed based on the evolution of state-of-the art control technologies two years before they are to go into effect and adjusted if appropriate.
· 2.63 lbs./MWh in 2006, 2007, 2008; and

· 2.25 lbs./MWh in 2009, 2010, 2011.

In New England and New York:
The average weighted NO_x emissions from landfill gas facilities contributing to a specific Green-e certified product shall not exceed 3.5 lbs./MWh. Landfills not otherwise required to flare are exempted from the Landfill gas NO_x emissions cap.

Cofiring of Landfill methane or Biogas with Natural Gas:
In New England, New York, the Mid Atlantic, Ohio, and California:
Co-firing of landfill methane or other eligible biogas with natural gas either piped directly to a natural gas facility or commingled in a natural gas pipeline is permitted if the following conditions are met:
· the landfill gas or eligible biogas is separately metered, and
· contracts are in place to allow CRS to verify that the landfill gas or eligible biogas was converted to electricity.

Only the amount of energy generated from the landfill methane or eligible biogas may count towards the 50% renewable criteria. Landfill methane and eligible biogas are the only renewable resources that can be co fired and still count toward the renewable percentage of a Green-e product. Regional exclusions and specifications are listed below.

In New England and New York:
Co-firing includes units permitted to burn oil no more than 60 days out of the year, and the facility must meet the emissions criteria for landfill gas facilities.

6. **Negawatts:**
   In Pennsylvania only, negawatts that meet the guidelines of the Negawatts Program as developed by CRS and the Pennsylvania Advisory Committee may be counted toward the renewable portion of a Green-e product.
7. **Ocean Based Resources:**
   Green-e will consider adopting ocean-based resources and will review these technologies as they mature and as practical application reaches near term.
8. **Fuel Cells Powered by Renewable Resources:**
   Fuel cells powered by any of the above eligible renewable resources are eligible.

III. New Renewable Resource Content
The new renewable requirement will begin on the later of:
· The first day of January following the approval of a Green-e Standard; or
· The first day of January at least 6 months after the opening of a retail electricity market.

CRS reserves the right to modify the new renewable requirement start date on a state-by-state basis to increase consistency within a region.

The new renewable requirement starts at 5% of total product content in the first year of implementation, increasing to 10% in the following year. This is a strict minimum requirement. Green-e has a goal of increasing the percentage further to 25% in 5% increments each year. These incremental increases will be approved by the Green-e governing Board on the recommendation of Regional Advisory Committees.

New Renewable Requirement Start Date Table

State	2000	2001	2002	2003	2004	2005	2006
California	5%	10%	10%	15%	TBD*	TBD*	TBD*
Connecticut	-	5%	10%	10%	15%	20%	25%
Delaware	-	-	5%	10%	15%	20%	25%
District of Columbia	-	-	5%	10%	15%	20%	25%
Maine	-	5%	10%	10%	15%	20%	25%
Maryland	-	-	5%	10%	15%	20%	25%
Massachusetts	-	5%	10%	10%	15%	20%	25%
New Jersey	-	5%	10%	10%	15%	20%	25%
New York	-	-	10%	10%	15%	TBD*	TBD*
Ohio	-	-	-	5%	10%	TBD*	TBD*
Pennsylvania	5%	10%	10%	15%	15%	20%	25%
Rhode Island	-	5%	10%	10%	15%	20%	25%
Texas	-	50%	50%	50%	50%	50%	50%

* Green-e commits to reviewing the requirement level on a state by state basis, at least two years before a change is made, to assess whether and how to meet the 25% new content goal.

An eligible new renewable generation facility must either be: (1) placed in operation (generating electricity) on or after January 1, 1997; (2) repowered on or after January 1, 1997 such that at 80% of the fair market value of the project derives from new generation equipment installed as part of the repowering; (3) a separable improvement to

or enhancement of an existing operating facility that was first placed in operation prior to January 1, 1997, such that the proposed incremental generation is contractually available for sale and metered separate from the existing generation at the facility; or (4) a separately metered landfill gas resource that was not being used to generate electricity prior to January 1, 1997. Any enhancement of fuel source that increases generation at an existing facility, without the construction of a new or repowered, separately metered generating unit, is not eligible to participate, with the exception of new landfill gas resources identified in (4) above. An eligible "new renewable" must qualify as an "eligible renewable resource" as described in the Green-e Code-of-Conduct. Hydropower facilities may not contribute toward achievement of the new renewable requirement at this time. In Pennsylvania, "negawatts" may not be used to meet the Green-e new renewable requirement. For power being sold into the New England and New York markets, the new renewable requirement applies to facilities available after January 1, 1998.

In Texas, an eligible new renewable generation facilities are defined as, (1) Renewable energy generators placed in service on or after September 1, 1999, or (2) A new facility includes the incremental capacity and associated energy from an existing renewable facility achieved through re-powering activities undertaken on or after September 1, 1999. This is consistent with the TX PUC definition.

IV. Emissions Criteria for the Non-Renewable Portion of a Green-e Product
The total emissions rate per kWh for SO2, NOx, and CO2 from the non-renewable portion of the eligible product may not exceed the average state or regional power emissions rates. Rates are calculated from EPA EGRID data, unless the regional system administrator, PUC or other authority makes more up to date information available. If system power is comprised of the local distribution utility mix it is considered the average system mix.

V. Power Content for Non-Renewable Portion of a Green-e Product
The product may not include any specific purchases of nuclear power in the non-renewable portion of the product other than what is contained in any system power purchased for the product.

VI. Interaction with Renewable Portfolio Standards
Green-e allows a percentage of a product's renewables content to be satisfied by renewable portfolio standard (RPS) state-mandated renewables up to the percentage RPS requirement as it is applied to a retail product. For example, if the RPS is set at 5% (either company based or product based), only 5% of the Green-e product can be satisfied with renewable power purchased to meet a mandated RPS requirement. Any remaining renewable power needed to fulfill Green-e requirements or product claims cannot be satisfied with renewables used to meet any RPS requirement. The Green-e new renewable requirement must be met entirely by renewable generation over and above anything required by state or federal RPS requirements. For example, in Texas the Green-e new renewable requirement is 50. The product mix must include the 50% Green-e new renewable requirement plus the state mandated RPS requirement. If the

product is comprised of 100% new renewables, it satisfies both the Green-e and state mandated RPS requirements.

VII. Products that Constitute a Portion of a Retail Offering

Green-e will certify blocks of renewable power. In New England, New York, California, Ohio, and the Mid Atlantic, the blocks must contain a minimum amount of 150 kWh per month of 100% new renewable resources on an annual basis. Blocks containing more than 150 kwh/month may include existing renewables for any amount above 150 kwh/month. In Texas, the blocks must contain a minimum amount of 200 kWh per month on an annual basis, available to commercial customers only.

The block products must be part of an all-requirements electricity offering. Any non-renewable portion of the electricity offering must meet the same emissions requirements and power content requirements as all other Green-e blended products (see IV, V above).

Revised July 22nd, 2003

Appendix C: Project Team: Statement of Qualifications

The project team for this report included William Steinhurst, Tim Woolf, Cliff Chen, all of Synapse Energy Economics, plus Paul Chernick of Resource Insight, Inc., and John Plunkett of Optimal Energy, Inc. Dr. Steinhurst was the Project Manager and oversaw preparation of all portions of the report. Steinhurst, Woolf and Chen addressed "green" energy offers, as well as overarching regulatory and process issues and prepared the comments for filing. Mr. Chernick, Dr. Steinhurst, and Mr. Chen researched and analyzed energy efficiency options, assisted by Mr. Plunkett. Biographies of the team members are given below. Full resumes are available on our web sites or upon request.

William Steinhurst

William Steinhurst is a Senior Consultant with Synapse Energy Economics. He has twenty-two years experience in utility regulation and energy and policy. Since joining Synapse, he has worked on renewable portfolio standards and portfolio management practices for default service providers and regulated utilities. Prior to joining Synapse, he worked at the Vermont Department of Public Service from 1981 to 2003, where he served as Planning Econometrician and, beginning in 1986 as Director for Regulated Utility Planning. Previously, he had served as Chief of Research and Statistics and Director of Planning and Research at the Vermont Department of Corrections; as Acting Deputy Commissioner and Director of Planning and Evaluation at the Vermont Department of Social and Rehabilitation Services, and as Director of Planning at the Vermont Agency of Human Services.

Dr. Steinhurst has written or co-authored dozens of papers and reports on statistics, modeling, energy policy, and regulation. He has consulted for various clients, including the Illinois Energy Office, the Massachusetts Executive Office of Energy Resources, the Natural Resources Defense Council, the Regulatory Assistance Project, the James River Corporation, and the Newfoundland Department of Natural Resources.

He has testified as an expert witness in approximately 30 cases, primarily in Vermont, on topics including utility rates and ratemaking policy, prudence reviews, integrated resource planning, demand side management policy and program design, utility financings, power purchases, statistical analysis, and decision analysis. He has been a frequent witness in legislative hearings and represented the State of Vermont in numerous collaboratives addressing energy efficiency, resource planning and distributed resources.

He has was the lead author or co-author of Vermont's long-term energy plans for 1983, 1988, 1991, and the 1998 report *Fueling Vermont's Future: Comprehensive Energy Plan and Greenhouse Gas Action Plan*.

He holds a BA in Physics from Wesleyan University, and an MS in Statistics and Ph.D. in Mechanical Engineering from the University of Vermont.

Tim Woolf

Tim Woolf is the Vice President of Synapse Energy Economics. He has twenty years of experience researching energy and environmental issues. The primary focus of his work includes electricity industry regulation and restructuring; technical and economic analyses of electricity systems; performance-based ratemaking; energy efficiency program design and policy analysis; renewable resource technologies and policies, clean air regulations and policies, municipal aggregation, and many aspects of consumer and environmental protection.

He has testified as an expert witness in many state regulatory proceedings and has authored numerous reports on electricity industry regulation and restructuring. He also represents clients in relevant working groups, task forces, and settlement negotiations. Mr. Woolf has published articles on electric utility competition and regulation in Energy Policy, Public Utilities Fortnightly, The Electricity Journal, Utilities Policy, Energy and Environment, and the Review of European Community and Environmental Law.

Prior to joining Synapse, he was a Senior Scientist and Manager of the Electricity Program at Tellus Institute, where he worked for consumer and environmental advocates throughout the United States. He has also worked as the Research Director for the Association for the Conservation of Energy in London, as a Staff Economist for the Massachusetts Department of Telecommunications and Energy, and as a Policy Analyst for the Massachusetts Division of Energy Resources. He began his career working for the Union of Concerned Scientists and the Massachusetts Public Interest Research Group.

Tim holds an MBA from Boston University and a Diploma in Economics from the London School of Economics, as well as a BS in Mechanical Engineering and a BA in English from Tufts University.

Paul Chernick

Paul Chernick is President of Resource Insight Inc. a consulting firm in Cambridge, MA. He has twenty-four years of experience in utility planning and regulation. He has advised clients on a wide range of issues including restructuring policy, market price forecasts, market valuation, stranded cost and divestiture of generation assets, planning and ratemaking for central supply, energy efficiency and distributed resources, cost allocation and rate design, and environmental externalities. Mr. Chernick has testified in more than 175 regulatory and court proceedings and has performed a wide variety of studies for public agencies, nonprofit organizations, and corporations.

Mr. Chernick holds SB and SM degrees from the Massachusetts Institute of Technology.

John Plunkett

John Plunkett is an economist who has worked in a variety of challenging settings for a diverse array of clients throughout his 22-year career. On behalf of utilities, government agencies, and citizen groups he has led inter-disciplinary teams in all aspects of developing, analyzing and negotiating comprehensive, state-of-the-art energy-efficiency investment portfolios throughout North America. Plunkett served as project leader and integration team leader for the NYSERDA efficiency and renewables potential study, He

has led program planning and evaluation work by Efficiency Vermont since 2000. This work, done in close consultation with EVT program managers, includes developing and negotiating performance indicators and targets in 2000 and again in 2002 for resource and economic savings, program results, market effects, and other outcomes over EVT's three-year contract terms. He led the consulting team providing program planning, management, and evaluation support for LIPA's Clean Energy Initiative from 1999 to 2002, on which he now serves as a senior advisor. He has been involved as an advisor to the non-utility parties to the Massachusetts efficiency collaboratives on cost-effectiveness analysis and performance incentives for utility program administrators since 1999.

Plunkett earned his B.A. in Economics with Distinction from Swarthmore College, graduating Phi Beta Kappa and winning the Adams Prize in Quantitative Economics for his econometric exploration of nuclear plant capital cost trends.

Cliff Chen

Cliff Chen is a Research Associate with Synapse Energy Economics, where he has written reports analyzing state renewable portfolio standards and regional clean energy plans. He has also worked on regulatory issues, electricity market price analysis, and energy efficiency programs.

Prior to joining Synapse, Mr. Chen was an intern at the City of San Jose Environmental Services Department, a volunteer in the U.S. Peace Corps in Guatemala, and a Sustainable Energy Fellow at the Natural Resources Defense Council. He graduated with a B.S. in Earth Sciences from Stanford University, where he studied energy science and policy.