STATE OF VERMONT
PUBLIC SERVICE BOARD

Amended Joint Petition of Central Vermont Public Service Corporation, Danaus Vermont Corp., Gaz Métro Limited Partnership, Gaz Métro inc., Northern New England Energy Corporation for itself and as agent for Gaz Métro Limited Partnership's parents, Green Mountain Power Corporation and Vermont Low Income Trust for Electricity, Inc. for approval of: (1) the merger of Danaus into and with Central Vermont, (2) the acquisition by Northern New England of the common stock of Central Vermont, (3) the amendment to Central Vermont's Articles of Association, (4) the merger of Central Vermont into and with Green Mountain, and (5) the acquisition by VLITE of a controlling interest in Vermont Electric Power Company, Inc.	)	Docket No. 7770

DIRECT TESTIMONY OF
ASA HOPKINS
ON BEHALF OF THE
VERMONT DEPARTMENT OF PUBLIC SERVICE

January 20, 2011

Summary: The purpose of Dr. Hopkins' testimony is to address the following criteria that the Department believes the Board should apply in evaluating the Petition: technical competence, fairness as a partner, suitability of buyer, compatibility of service territories, effect on employees and consistency with 2005 Vermont Electric Plan. In addition, Dr. Hopkins's testimony will address some proposed uses for the "Windfall Mechanism" that CVPS must provide as a result of this proposed transaction.

Direct Testimony of Asa Hopkins

Q. Please state your name and occupation.

A. My name is Asa Hopkins, and I am the Director for Regulated Utility Planning with the Vermont Department of Public Service ("the Department"). My responsibilities include direction of overall energy planning activities for the Department and the State of Vermont.

Q. Please describe your educational background and experience.

A. I have a B.A. in Physics from Haverford College, and a Masters Degree and Doctor of Philosophy in Physics from the California Institute of Technology. I have worked at the Department for about four months. Prior to joining the Department, I was an American Association for the Advancement of Science (AAAS) Science and Technology Policy Fellow at the U.S. Department of Energy, where I worked in the office of the Undersecretary for Science, Dr. Steven Koonin. Prior to that, I was a postdoctoral fellow in the Environmental Energy Technologies Division at Lawrence Berkeley National Laboratory.

Q. Have you testified before the Public Service Board before?

A. No, although I have also filed testimony in Docket 7815 today.

I. INTRODUCTION AND SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony?

A. My testimony summarizes the Public Service Department's review of the Amended Joint Petition of Central Vermont Public Service Corporation, Danaus Vermont Corp., Gaz Métro Limited Partnership, Gaz Métro Inc., Northern New England Energy Corporation for itself and as agent for Gaz Métro Limited Partnership's parents, Green Mountain Power Corporation and Vermont Low Income Trust for Electricity, Inc. for approval of: (1) the merger of Danaus into and with Central Vermont, (2) the acquisition by Northern New England of the common stock of Central Vermont, (3) the amendment to Central Vermont's Articles of Association, (4) the merger of Central Vermont into and with Green Mountain, and (5) the acquisition by VLITE of a controlling interest in Vermont Electric Power Company, Inc. In addition, I address certain of the criteria applicable to regulatory review of the proposed transactions. Specifically I address technical competence, fairness as a partner, suitability of buyer, compatibility of service territories, effect on employees and consistency with 2005 Vermont Electric Plan.

Q. What are the Department's conclusions regarding the proposed transaction?

A. In general, through testimony of John Wilson and Michael Dworkin, we have identified areas of Petitioners' merger proposal that the Department believes deserve modification in order to meet the general good standard set

forth in statute. I will not summarize those concerns and recommendations separately here.

Apart from those concerns and recommendations, we have concluded that the transaction satisfies the following criteria: technical competence, fairness as a partner, suitability of buyer, compatibility of service territories, effect on employees and consistency with 2005 Vermont Electric Plan.

In addition, it is the Department's position that the proposal set forth in the Petition for the satisfaction of the Board's requirement in Public Service Board's Order in Docket Nos. 6460/6120, June 26, 2001 does not meet the Order's standard as a legal matter. In that regard, I have reviewed the testimony submitted by AARP and find the arguments presented persuasive regarding why any clawback based upon the Order should be additive to, rather than included within, merger savings that are otherwise achieved. While I do not offer my own opinion on that issue here, leaving it to the Department legal briefing in this docket, I offer testimony below relating to other mechanisms that the Department believes can satisfy the terms of that Order.

II. CRITERIA

Q. On which of the criteria that board considers in evaluating proposed mergers and acquisitions will you be submitting recommendations?

A. I will be submitting recommendations on the following criteria:

(1) Technical Competence;

(2) Fairness as a Partner;

(3) Effect on Employees, and

(4) Consistency with the 2005 Vermont Electric Plan.

A. Technical Competence

Q. Have the Petitioners demonstrated that the acquiring entity has sufficient technical competence?

A. Yes. As noted by the Board in its Final Order in Docket 7213 approving the acquisition of GMP by Gaz Metro, "[a] determination of technical competency requires an assessment of the surviving company's ability to operate the electric system in a safe and reliable manner while charging customers just and reasonable rates."[1] While GMP had some difficulties in the mid-1990s, since then it has generally been operated well in terms of rates and service quality. As noted by the Board in the Gaz Metro Merger Docket,

> NNEEC also has a proven record of technical, financial and managerial competency through its twenty-year ownership of Vermont Gas Systems, Inc. Under NNEEC's ownership, VGS has increased its firm customer base from approximately 18,000 in 1990 to 37,000 in 2005. VGS also has complied with Board Rules and Orders. Thus, NNEEC and its parent, Gaz Métro, have a well-documented and an established track record for operating regulated and unregulated businesses in Vermont.

1 *Joint Petition of Green Mountain Power Corporation, Northern New England Energy Corporation (NNEEC), a subsidiary of Gaz Metro of Quebec, and Northstars Merger Subsidiary Corporation (Northstars) for approval of: (1) the merger of Northstars into and with Green Mountain Power; (2) the acquisition by NNEEC of the common stock of Green Mountain Power; and (3) the amendment to Green Mountain Power's Articles of Incorporation* Docket 7213 ("Gaz Metro Acquisition Docket"), Order of 3/26/07 at 23.

Gaz Metro Merger Docket, Docket 7213, Order of 3/26/07 at 24.

Since Gaz Metro acquired GMP in 2007, GMP, NNEEC and Gaz Metro have continued to demonstrate the "ability to operate the electric system in a safe and reliable manner while charging customers just and reasonable rates."

B. Fairness as a Partner

Q. Have the Petitioners demonstrated that the acquiring entity will demonstrate fairness as a partner?

A. Yes. The Board has noted that "[a] significant component of this consideration is whether the proposed merger transaction would result in any material changes in the management structure or any other operations of the surviving corporation." Gaz Metro Merger Docket, Docket 7213, Order of 3/26/07 at 27.

The proposed transaction does call for some changes in management structure, in that a number of officers from the acquired corporation, CVPS, will leave the Combined Company. However, since the acquiring company has an established track record in Vermont, the Department does not anticipate that these management changes will lead to any negative impacts on the operations of the Combined Company. The operational efficiencies achieved by the Combined Company will result in ratepayer savings.

Further, as noted above, the experience to date with NNEEC and Gaz Metro with relation to VGS and GMP supports the notion that the acquiring company will demonstrate fairness as a partner. Coupled with the measures being proposed by the Department in conjunction with the future governance of

VELCO, the financial restrictions suggested in the Department's testimony by John Wilson, and the continuing regulatory oversight of the Combined Company, I believe that this criterion is satisfied.

C. Effect on Employees

Q. Do you have an opinion as to the effect on employees of this proposed transaction?

A. Any merger of state utilities will lead to consolidation of operation and efficiencies; these aspects of a merger are critical to achieve ratepayer benefit. Nevertheless, job loss must be viewed in light of the general good of the state. Petitioners have proposed a reasonable process whereby savings will be acquired without layoffs (aside from a few senior executives) or forced relocations. The recent Memorandum of Understanding between GMP and the City of Rutland further solidifies these commitments. While a faster path to such savings would be possible, the proposal eases job loss concern in a manner that the Department views as positive for the general good of the state. The Department supports the Petitioners' proposal and believes it satisfies the criteria regarding effect on employees.

In addition, GMP and CVPS employees already collaborate regularly throughout Vermont where the utilities have adjoining service territories, so I believe that workforce integration will not cause undue strain on the employees of either company. I agree with the Petitioners that the combined utility is likely

to be a dynamic company and provide a good work environment, based upon the acquiring company's history to date.

D. Consistency with the 2005 Vermont Electric Plan.

Q. Have the Petitioners demonstrated that the proposed transaction is consistent with the 2005 Vermont Electric Plan?

A. Yes. The 2005 Vermont Electric Plan states, in part, that "[c]ontinued consolidation of both large and small companies, or opportunities for shared service capacities, to achieve competitive economies of scale, may be desirable over this 20 year planning period." Consolidation of GMP and CVPS, with appropriate conditions as sought by the Department, would be consistent with the 2005 Plan. The 2011 Vermont Electric Plan is embodied in the recently finalized 2011 Comprehensive Electric Plan. I believe it is most fair to hold the Petitioners to consistency with the 2005 Electric Plan, as that plan was the plan in effect at the time of Petitioners' filing. The 2011 Electric Plan is silent on the question of utility consolidation, so the merger of these utilities is not inconsistent with that Plan. Moreover, during 2011 the Department supported two other utility consolidations (Vermont Marble and Readsboro) and continues to believe that consolidations can provide opportunities for ratepayer benefits.

III. Windfall Mechanism

Q. Do you have an opinion as to options available to Petitioners that would satisfy the Board's Order in Docket Nos. 6460/6120, June 26, 2001 (the "windfall")?

A. In this testimony I will summarize a number of different options for what Petitioners could do with the "windfall" funds required by the Board's Order, along with some pros and cons for each as appropriate. I do not intend to suggest that there is a single, correct disposition of the windfall funds. I understand that the Department will submit briefs regarding any legal questions regarding the Order. Instead, one could think of my testimony as addressing the question: "What options would you consider to achieve benefits for CVPS ratepayers, supported by approximately $21 million in windfall funds and based on the Board's Order?"

Q. Are there general principles that should guide the disposition to CVPS ratepayers?

A. I would hold to four main principles:

1) The benefits returned to CVPS ratepayers should accumulate in rough correspondence, by ratepayer class, to the monies paid in through higher rates. That is, commercial ratepayers as a class should receive benefits in the same proportion to their contribution through higher rates, as should residential

ratepayers. It may not be practicable to divide the universe of CVPS ratepayers into many separate classes, but broad class contributions should be respected.

2) The windfall should be used to leverage other investment, thereby creating greater benefit for ratepayers. Program design choices that increase the leverage and return on each dollar of windfall investment should be favored over those that do not leverage this investment. In all cases, verified benefit to CVPS ratepayers should be required.

3) Just as we ask utilities to consider economic and environmental costs when undertaking least cost planning, the windfall funds should provide both economic and environmental benefits to CVPS ratepayers and to Vermonters as a whole.

4) Where possible, the windfall funds should leverage existing organizations and entities to deliver benefits and services to ratepayers. Creating additional organizations or financial entities could increase customer confusion and result in administrative costs and duplication, reducing ratepayer benefits.

Q. What are some windfall-sharing options that could align with these principles?

A. The first choice to make is whether the windfall should be returned to ratepayers as money (such as cash or bill credits) or if it should instead be directed toward other, energy-related purposes that benefit CVPS customers. (I am not going to discuss non-energy-related options other than the direct refund.)

The energy-related purposes include a number of options to advance energy efficiency and renewable energy, which help ratepayers through energy savings and energy security.

I will address the pros and cons of the money option first, and then discuss the other potential purposes in greater detail.

Q. Should the windfall monies be returned to ratepayers directly as money, such as through bill credits?

One simple option for the windfall would be to return the money as checks, cash, or bill credits to CVPS ratepayers. In order to do this, a formula would need to be derived to determine the amount of windfall to be returned to each ratepayer. It is practically impossible that each ratepayer would see exactly the same return as they paid in higher rates; this is also true of each of the other options described later in my testimony. One advantage of this option is that each ratepayer could expect to receive some return. A "back of the envelope" calculation based on 2010 CVPS ratepayer data indicates that the average residential ratepayer could receive a return of about $69, the average commercial ratepayer about $355 and the average industrial customer about $100,000.[2] Some households, businesses, or industrial concerns use more

2 These figures are generally consistent with those presented in AARP's testimony. To provide some context, the average residential ratepayer return of about $69 is roughly $20 less than an average monthly residential bill, the average commercial ratepayer payment of about $355is approximately $50 more than an average monthly commercial ratepayer bill, and the average industrial customer refund of about $100,000 is approximately $20,000 more than an average monthly industrial ratepayer bill.

electricity than others, and would receive larger refunds if the refunds were individualized; others would receive smaller refunds. The administrative overhead to determine the correct amount to refund to each ratepayer could also be considerable.

The most striking disadvantage of this option is that it fails to leverage the windfall with other private or public funds to produce lasting benefit to CVPS ratepayers, and fails to use these limited funds to return even greater value to CVPS ratepayers over time. As recognized by the Board in its Order approving the windfall mechanism, CVPS ratepayers contributed more than $16 million (or about $21 million, adjusted for inflation) to help CVPS.[3] A simple return of the windfall funds risks losing the opportunity for CVPS ratepayers to receive benefits worth closer to the actual value of their assistance.

Q. What are options that would increase the leverage of the windfall?

A. The windfall funds can produce lasting benefit greater than a direct refund through capital investments in infrastructure that produces continuing returns for ratepayers. An example would be investment in energy efficiency. Increasing energy efficiency generally requires upfront investment and generates a return by lowering energy bills over time. The economic benefit of increasing efficiency can much more than pay for the upfront cost, but a source

3 *See Tariff Filing of Central Vermont Public Service Corp*, Docket 6107, Order of 1/23/01, 211 P.U.R. 4th 53, 69 (January 23, 2001)

of capital is required at the start of the project. (Efficiency programs use screening tools to ensure that an efficiency investment will, in fact, pay for itself over time.) Further, electric efficiency savings produce a benefit in terms of reduced utility infrastructure and transmission costs that flow to all ratepayers.

Renewable energy generation technologies such as solar photovoltaics ("PV"), wind power, and farm methane also require substantial up-front capital, and pay back over many years through electricity sales and reduced environmental impacts. Owners of such systems benefit from having local (on-site) renewable sources of electricity; utility ratepayers as a whole can benefit from having multiple distributed sources of renewable power available within the service territory.

The windfall could be productively used as a source of capital for energy efficiency or renewable energy projects, leveraging the windfall amount with other public or private investment to produce economic and environmental benefits for ratepayers. The windfall's support for capital could take the form of loans, incentives, or grants.

I'll take this opportunity to define three terms I will use in describing these options: incentive, grant, and loan. By an incentive, I mean money distributed to individuals or businesses as part of an efficiency or renewable energy project that does not have to be paid back and improves the economics of the project to the point that the decision-maker for the project chooses to

undertake it. Incentives can be custom-designed for a particular project or prescriptive (a standard fixed value for a common efficiency measure, for example). By a grant I mean money, commonly distributed through a competitive process, that does not have to be paid back. A grant is generally larger than an incentive, and covers a larger fraction of the cost of a project. By a loan I mean money distributed to those who qualify for it (from an underwriting or credit-worthiness standpoint) and which must be paid back over time, with some rate of interest.

Windfall-based funding, be it loans, grants, or incentives, could be established with pre-determined set-asides available for various clean energy options such as electrical efficiency, thermal efficiency, and renewable energy. In addition, support for renewables could be tied to efficiency, such as by requiring that loan recipients have energy audits or take particular actions to reduce their energy consumption prior to or coupled with any investments in renewable energy.

Loans generally have higher leverage than incentives or grants because they allow the same dollars to be used more than once. (As a loan is repaid, the same dollars can be loaned out again.) A loan loss reserve, used to allow guarantees for clean energy loans, has potential for particularly high leverage because it reduces the interest rate on loans totaling many times the size of the reserve; it can also widen the pool of individuals eligible for loans due to the

guarantee it provides to lenders. Nevertheless, grants or incentives may be the only tools capable of benefiting some ratepayers, such as low-income households or municipal governments, due to their relative inability to rely on credit.

Q. Please describe some of the options for using the windfall to increase energy efficiency.

A. The first energy efficiency option to consider is to replicate for CVPS ratepayers what the Green Mountain Power ("GMP") Energy Efficiency Fund has done for GMP ratepayers. The GMP Energy Efficiency Fund (supported by GMP, the Department, AARP, and others) was the mechanism approved by the Board and chosen to meet the windfall sharing requirements stemming from GMP's acquisition by Gaz Metro.

The GMP Energy Efficiency Fund was implemented via a contract between GMP and Vermont Energy Investment Corporation ("VEIC"), which operates the Vermont's statewide efficiency programs. The GMP Energy Efficiency Fund has taken the form of providing additional funding that "piggybacked" on available Efficiency Vermont funding to increase the available incentives and other programs serving the GMP service territory. Consistent with the Board order, this funding was divided into residential and commercial/industrial portions, in rough proportion to the contributions of these sectors through higher rates. This fund has provided benefits to program

participants that are greater than the program's costs, thereby achieving the objective of greater ratepayer value. All of the projects supported by the fund must be cost-effective, using the societal cost/benefit test approved by the Board for energy efficiency programs in Docket 5270 and reaffirmed in Docket 5980. The GMP Energy Efficiency Fund Savings Claim Summary for 2009 is available online at http://psb.vermont.gov/sites/psb/files/projects/EEU/gmpefficiencyfund/2009FinalGMPEEFSavingsClaimSummary.pdf

. This summary documents that, though 2009, this fund had delivered $4.41 million in benefits to GMP ratepayers while expending $1.97 million, for a benefit-cost ratio of more than 2 to 1.

In the GMP program, the return on electric efficiency investment (for both participants and ratepayers more broadly) is higher for commercial than residential electric efficiency. Residential energy users in Vermont tend to have greater opportunities for thermal energy efficiency than electrical, whereas commercial energy users tend to have greater electric loads and electric efficiency potential. (Commercial users can also benefit from greater thermal efficiency, of course.) Moreover, territory and statewide benefits from commercial electric efficiency can be greater, due to the greater diminishment of peak load that contributes to suppressing Vermont's share of regional transmission costs.

Learning from the GMP Efficiency Fund, it could make sense to develop separate programs for commercial and residential energy users that target particular needs and higher-leverage activities in each sector. It is important to note that the efficiency environment in the state has changed somewhat since the GMP Efficiency Fund was established. For example, the budgets for the electric Energy Efficiency Utilities ("EEUs" – both Efficiency Vermont and Burlington Electric Department) have increased from about $30.75 in 2008 to about $40.1 million for 2012. As more electric efficiency has been captured, the "yield," or the energy savings per dollar of efficiency spending, has fallen. In combination with the increased EEU budgets, this change in yield means that windfall funds spent on additional standard EEU activities and incentives (as in the GMP Efficiency Fund model) would not return as much additional energy savings as they might have several years ago. Nevertheless, well-targeted electric efficiency programs extending Efficiency Vermont's existing programs and aimed at particular classes of end users would be likely to return significant benefits to CVPS ratepayers. Thermal efficiency investments, coordinated with and/or extending programs runs by community action programs and NeighborWorks of Western Vermont, as well as Efficiency Vermont, would also be likely to return significant benefits to CVPS ratepayers.

Q. Must windfall funds used for energy efficiency be used only for electric efficiency, or could they also be used for thermal efficiency?

A. The windfall-sharing requirement does not require that the return of value to ratepayers must be somehow related to electricity. For example, simple cash refunds to ratepayers would not be tied directly to electricity or electric efficiency. This stands in contrast to the electric efficiency charge that funds the electric EEUs; these monies are explicitly justified as electric charges to fund electric efficiency.

However, the Board Orders regarding the annual plans for the GMP Energy Efficiency Fund (Dockets 7412, 7492, 7574, and 7687), along with the Board's Order in Docket 7213 establishing that fund, raise real concerns regarding use of electric ratepayer funds for thermal efficiency measures. In practice, efficiency measures conducted primarily for thermal purposes do result in electric energy savings as well. For example, more efficient furnaces also use more efficient fan motors, and insulation and air sealing reduce air conditioning load in addition to heating load. One thing we can learn from the GMP Energy Efficiency Fund experience is that it has proven hard to find additional cost-effective electric efficiency measures for residential customers beyond those already covered by Efficiency Vermont programs. Given our principle that CVPS ratepayers should receive benefits in rough proportion to their contributions through rates, finding sufficient electrical efficiency measures to

provide real value to residential ratepayers may prove a challenge. Allowing windfall funds to benefit these households through heating bill savings rather than electric savings would allow significantly greater benefit to flow to this ratepayer class.

Windfall-funded support for efficiency could cross the barriers that have been erected between thermal (generally building shell improvements and fossil-fuel or biomass heating system installations/replacements, with some electric air conditioning) and electrical efficiency, as well as renewable energy. For example, incentives or loans supported by the windfall could support improved insulation and air sealing, installation of a ground-source heat pump, and rooftop solar PV on a single home. Restricting windfall funds to only electric benefits unnecessarily limits options that could provide significant benefits to CVPS customers.

Increasing thermal efficiency and the use of renewable energy for heating Vermont buildings is a substantial challenge, but one the state must tackle in order to meet the 2011 Comprehensive Energy Plan target of 90% renewable energy across all sectors by 2050. This requires both dramatically increased thermal efficiency (with its economic and comfort benefits) and increased use of renewable fuels (solid biomass or biofuels) and heat pumps for heating. Efficiency and renewable energy support that could be provided to CVPS ratepayers as a result of this acquisition and merger could allow

comprehensive "whole building" treatment of Vermont's buildings to the benefit of CVPS ratepayers and the state as a whole. The lack of robust thermal efficiency funding and renewable thermal energy measures in Vermont could be significantly aided by such use, and provide real value to CVPS ratepayers in an amount greater than the windfall payment itself.

Q. What about loans for energy efficiency or renewable energy (together referred to as "clean energy")?

A. A loan fund could be used for supporting clean energy development. It could be used to provide low- or zero-interest loans to ratepayers to fund such energy investments in their homes and businesses. A loan fund would have the advantage of increasing the suite of tools available to energy consumers, independent energy consultants, and efficiency providers when approaching the task of increasing a home or business's energy efficiency or use of renewable energy.

A loan fund would have the potential to stretch limited dollars further for the benefit of CVPS ratepayers, through two mechanisms:

1) A loan fund can be established in a "revolving" fashion, where loan repayments from one recipient are then available to be loaned out to another; this allows each dollar to be used more than once.

2) A loan fund can be used to "buy down" the interest rate on a loan procured through a bank or credit union. For example, if a homeowner borrows $10,000 of which $5,000 comes from a bank, with a 6% interest rate, and $5,000 come from the loan fund with a 2% interest rate, the net rate paid by the recipient is 4%, and the loan fund has stretched its dollars by a factor of two. The loan fund could adjust its interest rate and the loan repayment period (and therefore the amount paid back by the recipient) to account for the needs of particular groups of customers or technologies, as may be appropriate.

One of the tools available to a loan fund is the ability to house a "loan loss reserve" fund. This reserve allows the fund to guarantee the loans it issues in partnership with other financial institutions, lowering barriers to participation by these institutions and the interest rate they would charge. A loan loss reserve fund can benefit many loan recipients without actually being expended, allowing great leverage for these dollars. For example, a Property Assessed Clean Energy (PACE) loan loss reserve fund (discussed further below) recently established for this purpose has been capitalized with $1,000,000.

Depending on how the loan fund is designed and administered, projects completed using the fund may be good candidates for repayment on the recipient's electric bill. This is referred to as "on-bill financing." On-bill financing can reduce the administrative barriers to loan recipients and make repayment easy, without an additional bill to pay each month. Further, the loan

may be able to stay with the electric bill should the customer move from the premises, removing an additional barrier to clean energy investment, where customers are hesitant to invest because they aren't sure they will reap all of the long-term benefits of the investment. This mechanism may be especially useful with renters who otherwise have little incentive to invest in clean energy for property which they do not own. With appropriate loan terms and cost-effective efficiency investments, the recipient's average monthly bill can go down – their energy payments can be structured to fall by more than their loan service amount.

Q. What is the role of grants in furthering clean energy?

A. Clean energy can also be increased through the use of grants. A competitive solicitation could rate applications based on energy savings, environmental impact, cost-effectiveness, comprehensiveness, innovation, or other criteria in order to ensure that significant benefit is provided from the awarded grants. Grants are particularly useful in reaching customers, including governments and schools, for which loans are not effective. For example, a windfall-supported grant program for such CVPS customers could build on the success of the Energy Efficiency and Conservation Block Grant (EECBG) program, part of the American Recovery and Reinvestment Act (ARRA), which provided grants totaling $5,082,948 to 130 Vermont municipal and school projects. The Department received 323 initial applications in response to the solicitation

requesting over $13 million in funding for energy efficiency and renewable energy projects.

Q. You mentioned PACE. How would a loan fund established with windfall monies relate to other financing options?

A. Property Assessed Clean Energy (PACE) is available and appropriate for use by homeowners with significant equity in their homes. Vermont Gas Systems, through a partnership with a local credit union, makes low-interest loans available for qualifying customers' efficiency projects. Both the VGS tool and PACE financing are only available in certain towns or service territories. Home equity and standard business loans can also be available, although the interest rates on these financial tools may be high enough to deter their use for clean energy investments. Some renewable energy developers can provide access to lease-to-own or other payment-based financing for renewables. VEIC is in the initial stages of implementing a new loan tool targeted for efficiency in small-to-medium commercial enterprises, and the Department is working with VEDA to determine whether this program can be backed in part by Qualified Energy Conservation Bonds (QECBs). QECBs are tax-advantaged bonds; the money raised by state or local governments through their issuance must be used to support clean energy deployment.

A clean energy loan fund serving the entire CVPS service territory could make affordable financing available for a wider range of energy consumers than

current tools provide. It would be important to take interactions with other incentives, grants, and loan mechanisms into account when designing the details of energy-related programs funded by the windfall.

Q. What would happen to a revolving loan fund over time? Would such a fund support only CVPS ratepayers forever?

A. While a revolving loan fund could continue to provide loans only to CVPS-territory projects and customers, the Board could instead decide that maintaining this distinction forever is not required. Benefits of a loan fund can be quantified, and after a threshold amount of benefit has accrued to CVPS ratepayers, the loan fund could be made available to all Vermonters. If this were to be a part of the windfall design, the Department would expect not only robust measurement of the ratepayer benefit but also a "return" to CVPS ratepayers greater than the approximately $21 million of windfall value prior to use for any wider purpose. If such a loan fund were one part of a portfolio of tools supported by the windfall funds, each of which benefits CVPS ratepayers in a different manner, the determination of the threshold benefit should take into account the size of the fund and the composition and benefits of the rest of the portfolio. If the loan fund were charged with supporting low- or zero-interest loans, its value in real (inflation adjusted) terms could shrink over time, but it could still provide significant benefits ratepayers for many years into the future.

Q. Please describe some of the other options for using the windfall funds to increase use of renewable energy for the benefit of CVPS ratepayers.

A. In addition to the loans and grants described above, renewable energy incentives can also provide ratepayer benefits by increasing the rate of deployment. One option for the windfall would be to provide funding to support renewable development within the CVPS service territory. Such funding could be administered through an existing program such as the Clean Energy Development Fund ("CEDF"), or a similar entity. For example, the CEDF runs a small-scale renewable energy program that provides prescriptive incentives to support the installation of small solar PV, solar hot water, micro-hydro and wind generators. The windfall funds could be used to increase the incentive amount or to offer the incentives to a greater number of participants. CEDF has provided an incentive of $0.75 per Watt of installed capacity for solar PV. For scale, this means that $1 million in incentives supports the development of 1.33 MW of solar capacity, or over 250 typical home-sized (5 kW) solar PV installations. At the current average solar PV of $6 per Watt the $.75 per Watt incentive would provide a 7-to-1 leverage. That is, $1 million of incentives would pair with $7 million in private investment. Such a program, like all the others I've discussed, could be designed to hold to the principle that residential and commercial customer sectors would be awarded incentives proportionally to what they paid in excess rates.

Another option for renewable electric generation would be to support deployment on farms. Methane digesters are a known and established renewable generation technology on Vermont farms. Farm methane is a distributed renewable resource that can provide baseload generation (available consistently around the clock), supporting integration of diverse renewable resources into the utility's portfolio. Farms may also be well suited to deployment of solar PV or wind, provided that prime agricultural land is not negatively impacted. One particular challenge for these sites can be interconnection to the grid; upgrades can be required to allow two-way energy flow at greater magnitudes than circuits were originally designed to handle. The costs of interconnection negatively impact the economics of renewable electricity deployment; support in the form of loans or grants, funded by the windfall, could make these projects economically sustainable.

Q. Are there additional benefits that would come from targeting efficiency or renewables to particular locations in CVPS territory?

A. Yes. Peak-coincident electric energy efficiency and renewable electricity generation in certain locations on the electric grid provides system-wide benefits in addition to the economic and environmental benefits from the projects themselves. For example, in areas where load growth could result in the need for additional electrical infrastructure (such as redundant power lines or an additional substation), efficiency and distributed generation could defer these

needs, reducing the costs that ratepayers throughout the utility's service territory would pay for this infrastructure. If windfall-supported efficiency and renewables were targeted to areas with known transmission or distribution infrastructure needs, these investments would provide additional benefits to CVPS ratepayers.

Q. Are there particular classes of end users that need different incentives or programs than standard residential or business customers?

A. Yes. In particular, public-serving institutions such as state and municipal government, schools, and non-profit low-income housing organizations can have particular hurdles and advantages as targets for energy efficiency and renewables. Investments in the efficiency of these facilities benefit the broader community who otherwise would be responsible for paying their energy costs, and therefore benefit a larger group of ratepayers within CVPS territory. For example, increasing the efficiency of municipal buildings can allow towns to spend more money on services (or collect less in taxes), rather than spending that money on energy. However, these institutions can have a difficult time accessing the capital necessary to make such investments.

As with efficiency, public-serving institutions may benefit particularly from renewable energy deployment, and require specialized incentives. These institutions typically have different tax liabilities than for-profit businesses or homeowners, making federal tax credit support for renewables unavailable. A

comprehensive approach to efficiency and renewables in these institutions, with appropriate low-interest loans or grants funded by the windfall, could provide substantial benefits to both the institutions and to the taxpayers (who are also ratepayers) who support them.

Q. Are there windfall-sharing options other than energy efficiency and renewable energy generation that you haven't mentioned yet?

A. One additional option would be to use a portion of the windfall to support the installation of electric vehicle charging infrastructure in the former CVPS territory. This is enabling infrastructure for both 1) the increased efficiency of transportation energy use that is possible using plug-in vehicles and 2) the introduction of greater renewable energy into the transportation sector, because Vermont's electricity has high renewable content. While public charging infrastructure might be the most visible infrastructure to support, at the current level of plug-in vehicle penetration this infrastructure is unlikely to be used enough to generate significant benefits to ratepayers. Instead, a windfall loan fund could support the installation of chargers in private homes or businesses through a low- or zero-interest loan when a plug-in vehicle is acquired. This would have the effect of lowering the upfront cost to purchase such a vehicle, serving as an incentive to increase the efficiency and renewable energy use in Vermont's transportation sector. Electric vehicles, with accompanying infrastructure, have the potential to benefit ratepayers by moderating the peaks

and valleys in load on the electrical grid; this moderation increases infrastructure utilization.

Q. You've described a wide array of potential beneficial uses of the windfall funds. Would you suggest the full amount of windfall funds be used for any one of these purposes?

A. It is unlikely that the optimal distribution of windfall funds, achieving greatest ratepayer benefit with the lowest administrative cost and an appropriate distribution across rate classes, could be achieved through use of only a single program. In fact, there may be significant benefits for CVPS ratepayers if a number of potential options were available so that individual ratepayers could choose the right tool to meet their needs, while also providing system benefits to all CVPS ratepayers. The purpose of my testimony has been to describe a number of options, and not to describe or construct the optimal portfolio.

IV. SECTION 248(a)(2) PROMOTION OF THE GENERAL GOOD

Q. In addition to the criteria enumerated in subsection (b), 30 V.S.A. § 248 requires the Board to find that the acquisition will promote the general good of the state before it approves the current petition.[4] Based on the information you have reviewed to date in this proceeding, including the issues and concerns raised by other DPS witnesses, can you conclude that the transaction promotes the general good of the state?

[4] 30 V.S.A. § 248(a)(2).

A. Provided that appropriate mechanisms are put in place to advance the VELCO governance goals set forth in Michael Dworkin's testimony, to address the financial concerns set forth in John Wilson's testimony, and to ensure the smooth integration of the two companies as mentioned in Sean Foley's testimony, yes. The proposed merger of GMP and CVPS presents an opportunity for increased efficiencies and savings that promise to benefit ratepayers and the general good of the state.

Q. Does that conclude your testimony?

A. Yes, it does at this time.