



155 Fleet Street, Suite 205  
Portsmouth, NH 03801

603.766.1913 PHONE  
603.766.0401 FAX

[www.TRCSolutions.com](http://www.TRCSolutions.com)

June 1, 2010

Jack Ruderman  
Director, Sustainable Energy Division  
State of New Hampshire Public Utilities Commission  
21 South Fruit Street, Suite 10  
Concord, NH 03301

Re: ***Proposal for Greenhouse Gas Emissions Reduction Fund***

Dear Mr. Ruderman:

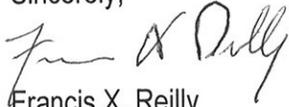
TRC Energy Services (TRC) is pleased to submit a proposal for Category II of New Hampshire Public Utilities Commission (NH PUC) RFP for Greenhouse Gas Emissions Reduction Fund. TRC is currently working with NH PUC on the NH EnergySmart Schools Program, where TRC will benchmark 250 New Hampshire K-12 schools to promote energy efficiency and establish statewide baselines of energy consumption.

The TRC Team can also offer the following benefits:

- The experience of designing and implementing award-winning energy efficiency programs in multiple states including C&I programs for the New York State Energy Research and Development Authority (NYSERDA), the State of New Jersey's Office of Clean Energy (NJOCE), and the Long Island Power Authority,
- A highly experienced team of program management experts for Program start-up, ongoing delivery and future program development,
- Coverage across the NH PUC territory, with an office based in Portsmouth, NH,
- Unparalleled industry experience in delivering similar energy efficiency programs to State-wide energy agencies and major utilities,
- Dedication and proven levels of service quality,
- Long-term demonstrated record of achieving large-scale levels of energy reduction and overall savings, and
- A unique perspective as a Team that does both C&I program planning/design/evaluation and program implementation.

The TRC Team's knowledge and experience in the design, management, and implementation of C&I energy efficiency programs throughout the nation will serve as cornerstones for the successful launch and implementation of NH PUC's Program. The signature below is that of the authorized negotiator.

Sincerely,



Francis X. Reilly

Senior Vice President, TRC Energy Services





**Proposal for  
Greenhouse Gas Emissions  
Reduction Fund  
RFP #10-001**

**Category II**

***Submitted to:***

**State of New Hampshire Public Utilities Commission**  
21 South Fruit Street, Suite 10  
Concord, NH 03301

***Prepared by:***

**TRC Energy Services**  
155 Fleet Street, Suite 205  
Portsmouth, NH 03801

**June 1, 2010**

# TABLE OF CONTENTS

<b>1.0 INTRODUCTION (TITLE PAGE)</b> .....	<b>1</b>
1.1 PROGRAM TYPE AND TITLE .....	1
1.2 PROGRAM SUMMARY .....	1
1.3 IDENTIFICATION OF APPLICANT ORGANIZATION.....	1
1.4 LENGTH OF PROGRAM.....	1
1.5 TOTAL PROGRAM COSTS.....	1
1.6 GHGERF FUNDING REQUESTED .....	1
<b>2.0 PROPOSED WORK SCOPE AND SCHEDULE</b> .....	<b>2</b>
2.1 PROGRAM PLAN AND IMPLEMENTING GOALS SUCCESSFULLY.....	2
<b>3.0 PROGRAM BENEFITS</b> .....	<b>5</b>
3.1 ENERGY SAVINGS .....	5
3.2 COST-EFFECTIVE .....	5
3.3.1. PROMOTE MARKET TRANSFORMATION .....	6
3.3.2. INNOVATIVE TECHNOLOGIES.....	6
3.3.3 ECONOMIC DEVELOPMENT .....	7
3.3.4 REDUCED ENERGY COSTS.....	7
3.4 BEST PRACTICES .....	7
3.5 M&V COMPARED TO GOALS.....	7
3.6 PROMOTE COLLABORATION.....	7
<b>4.0 MEASUREMENT &amp; VERIFICATION (M&amp;V)</b> .....	<b>8</b>
<b>5.0 BUDGET EXPLANATION</b> .....	<b>9</b>
5.1 PROPOSED BUDGET .....	9
5.2 DETAILS ON KEY PERSONNEL.....	9
5.3 INDIRECT COST RATES AND PERFORMANCE CONTINGENCY.....	9
5.4 OTHER POTENTIAL FUNDING SOURCES .....	9
<b>6.0 APPLICANT QUALIFICATIONS</b> .....	<b>10</b>
6.1 PRIOR EXPERIENCE.....	10
6.1.1 PERSONNEL QUALIFICATIONS .....	10
6.2 SUBCONTRACTORS.....	10
6.2.1 SUBCONTRACTOR'S ORGANIZATION AND ABILITIES .....	10
6.3 CRIMINAL CONVICTIONS .....	10

- Appendix A Letters of Support
- Appendix B EEO Policy
- Appendix C New Jersey Pay for Performance Program
- Appendix D Resumes

# 1.0 INTRODUCTION (TITLE PAGE)

This section provides details on the Program and TRC Energy Services.

## 1.1 Program Type and Title

TRC is bidding on Category II: Programs that will establish a portfolio of energy efficiency projects at large energy user sites to produce significant energy savings and greenhouse gas (GHG) reductions. For the purposes of this document, this Program will be called Pay for Performance (P4P).

## 1.2 Program Summary

The P4P Program takes a comprehensive, whole-building approach to saving energy in large Commercial and Industrial (C&I) facilities while linking incentives directly to energy savings. The Program relies on a network of qualified Partners who provide technical services under direct contract to building owners. Partners will develop an Energy Reduction Plan (ERP) for each project with a whole-building technical component of a traditional energy audit, a financial plan for funding the energy efficient measures and a construction schedule for implementation of the facility improvements. An energy verification component ensures a minimum source energy savings of 15% and an associated reduction in greenhouse gas emissions.

## 1.3 Identification of Applicant Organization

TRC Energy Services (TRC), a division of TRC Environmental Corporation, is a Connecticut corporation incorporated in 1969. TRC's headquarters is located at 650 Suffolk Street, Suite 200, Lowell, MA 01854. TRC is registered with the Secretary of State to do business in New Hampshire. Our Taxpayer Identification Number is 06-0861618. TRC has identified several potential Program Partners who are New Hampshire-registered firms in good standing and are certified to practice Engineering by the New Hampshire Board of Professional Engineers. Letters of support are included in Appendix A. TRC is an equal opportunity employer (EEO) and has provided a copy of our EEO policy in Appendix B.

## 1.4 Length of Program

The Program is anticipated to run for approximately 24 months with a minimum of 18 months and maximum of up to 30 months.

## 1.5 Total Program Costs

TRC anticipates the total Program Cost to be approximately \$10.5 million including Program incentives. This estimate assumes that 40% of project costs are covered through direct incentives. More details on cost are provided in Section 5.0 of Program Plan.

## 1.6 GHGERF Funding Requested

Of the total Program Cost, TRC is requesting \$5 million from the State's Greenhouse Gas Emissions Reduction Fund (GHGERF). These monies will be used to support energy efficiency, conservation, demand response, and market transformation aspects of the proposed program. The proposed Program is scalable and TRC would be open to discussions with the NH PUC concerning a different GHGERF funding level.

## 2.0 PROPOSED WORK SCOPE AND SCHEDULE

This section covers details on execution of the program plan and anticipated schedule.

### 2.1 Program Plan and Implementing Goals Successfully

According to a report published in 2009 by GDS Associates Inc., the New Hampshire C&I sector consumes the majority of electric and fossil fuel energy through lighting, space heating, cooling, ventilation, and process equipment. Therefore, the most effective approach to conserve significant amounts of energy in large C&I facilities is to make improvements across all of these categories in a single, comprehensive project. The Pay for Performance (P4P) Program links incentive money directly to energy savings. This approach encourages building owners to invest in multiple improvements to maximize their incentives while reducing energy consumption and greenhouse gas emissions.

The Program will require large C&I building owners to contract with approved Program Partners to carry out the requirements of the Program. Partners will consist of qualified engineering and energy consulting firms who will act as the building owners' energy expert. The Partners will conduct a whole-building energy assessment, which requires building simulation with an ASHRAE-approved model and benchmarking the building. By utilizing the EPA ENERGY STAR® *Portfolio Manager*, a building baseline energy use will be established. The Program then requires that the Partner achieves a minimum of 15% source energy savings from the baseline energy use. The 15% energy reduction must be derived from at least two independent measures (such as lighting and HVAC improvements), where lighting measures accounts for no more than half of the total savings.

The Partner will work with the building owner to develop a scope of work that meets the 15% requirement. The Partner will provide viable recommendations for energy efficiency measures, including predicted energy savings (kWh, kW and MMBtu), estimated project cost, and simple payback. Once the building owner and Partner have selected the most appropriate measures to implement, the Partner compiles all of this information into a comprehensive ERP. Upon construction completion, TRC conducts a post-inspection to verify that the measures were installed per the approved ERP. At this stage the Partner begins the twelve month post-construction energy verification period to track how actual savings compare to projected energy savings. The verification method is further discussed in Section 4.0 of this document.

By directly linking Program requirements to industry standards, such as ASHRAE 90.1 and EPA ENERGY STAR, Program documents can be more readily understood. A summary of the documents that have been prepared for the NJ P4P Program, and will be the basis for the NH Program, include:

- P4P Partnership Agreement
- P4P Application
- P4P Program Guidelines (94 pages), including sections addressing:
  - Energy Auditing Requirements
  - Combined Heat and Power Systems
  - Model Simulation Guidelines
  - Metering Plan
  - Post Construction Benchmarking Report
- P4P ERP Template (Word template)
- P4P ERP Tables (Excel-based spreadsheet tool)

Incentives provided by the Program are based on the projected savings outlined in the ERP and the realized savings at the end of the verification period. Below is an outline of the incentive structure in the Program.

<b>Incentive #1</b>	<ul style="list-style-type: none"> <li>\$0.10 per square foot</li> <li>Capped at \$50,000</li> <li>Contingent on proceeding with recommended work scope (min. 15% savings)</li> </ul>
<b>Incentive #2</b>	<ul style="list-style-type: none"> <li>\$0.19 per projected kWh saved and \$20.00 per projected MMBtu saved</li> <li>Designed to cover approximately 30% of total project cost</li> <li>Paid upon successful post-construction inspection</li> </ul>
<b>Incentive #3</b>	<ul style="list-style-type: none"> <li>\$0.05 per actual kWh saved and \$5.00 per actual MMBtu saved</li> <li>Designed to cover approximately 10% of total project cost</li> <li>Paid upon approval of one-year post construction benchmarking report</li> </ul>

The proposed incentive budget for the Program is roughly \$4.3 million (see Section 5.0). To ensure that any given project does not consume a disproportionate share of the budget, an incentive cap of \$250,000 is proposed. This incentive cap may be increased for exceptional projects with TRC and PUC approval.

## 2.2 Key Partners/Allies

Qualified Partner firms play a vital role in the Program. As previously discussed, Partners will be responsible for the following:

- Completing the ERP
- Assist the building owner in project scoping and contractor procurement
- Construction verification and quality assurance
- Collecting post-construction utility data for the energy verification period
- Submitting all documentation to TRC per Program requirements

Payment for these services will be provided by the building owner through a contract agreed upon between the Partner and the building owner. Incentives from the Program will be requested by the Partner but paid directly to the building owner. This strategy provides a critical “check and balance” between the Partner and building owner. TRC will provide Program specific training and support to all Partners.

The Program will approve qualified firms as Program Partners. TRC anticipates that the Program will launch with approximately five Partners but there could be as many as ten or more. The following firms possess the qualifications required of a Partner and have stated their intentions (see Appendix A) to participate in the Program as soon as it becomes available, pending the Partner approval process:

1. *Anix, LLC*  
Tim Nichols, P.E., Principal  
4 Margaret Lane, Lee, NH 03861 - 603-292-6245
2. *Investment Engineering*  
Matt Holden, P.E., LEED-AP, President  
The Sparhawk Mill, Suite 107, Yarmouth, Maine 04096 - (207) 846-7726



## 3.0 PROGRAM BENEFITS

### 3.1 Energy Savings

Based upon TRC’s experience with similar comprehensive energy efficiency programs in New Jersey and New York, the following energy savings figures can be expected for large C&I customers as defined in the RFP of those with electric demand of  $\geq 100\text{kW}$  or  $\geq 1,000$  MMBtu for space or process heating.

The New Jersey P4P Program currently has a Program pipeline of more than 100 projects. Using data from a sampling of these projects, TRC developed the following analysis to estimate energy savings from the New Hampshire P4P Program.

#### Projected Energy Savings Analysis

New Jersey P4P Program Data			Notes
1	1.22	kWh per \$ of project cost	Based on 27 projects representing 5.5 million sq. ft. including a mix of building types: Office, K-12 School, Industrial, College, Hospital, Datacenter, Warehouse, and Multifamily
2	0.0004	kW per \$ of project cost	
3	0.0049	MMBtu per \$ of project cost	
NH Estimated Program Data			
4	\$4,300,000	Total Incentive Budget	As proposed
5	\$100,000	Average Incentive	Based on ~ 40% of project cost
6	\$250,000	Average Project Cost	Based on NJ and NY program data
7	43	Number of Projects	Based on est. project size [Line 4 / Line 5]
8	\$10,750,000	Total Cost of all Projects	[Line 6 * Line 7]
9	<b>13,161,435</b>	<b>Annual kWh Savings</b>	[Line 1 * Line 8]
10	<b>4,108</b>	<b>Annual kW Savings</b>	[Line 2 * Line 8]
11	<b>52,851</b>	<b>Annual MMBtu Savings</b>	[Line 3 * Line 8]
12	15	Typical Measure Lifetime	Based on Industry Experience
13	<b>197,421,524</b>	<b>Lifetime kWh Savings</b>	[Line 9 * Line 12]
14	<b>792,761</b>	<b>Lifetime MMBtu Savings</b>	[Line 11 * Line 12]

Energy efficiency measures typically included in projects of this size and scope include:

- Lighting & Lighting Controls – 15 year measure life
- HVAC upgrades (Chillers, Boilers, Rooftop A/C) – 15-20 year measure life
- Energy/Building Management Systems (EMS/BMS) – 20 years +
- Envelope Improvements (Windows, Insulation) – 25-30 years
- Advanced Motor Control (VFD’s) – 15+ years
- Process Improvements – 5-10 year measure life

### 3.2 Cost-Effective

TRC has prepared a program design that will be cost-effective while maintaining a high level of quality control. Program documents and required tools will assist in ensuring that work scopes are cost effective. For example, the Program will provide approved Partners with an Excel-based spreadsheet tool for

developing and reporting their work scopes as part of the ERP. Built into this tool will be an automated calculation of the total project's Internal Rate of Return (IRR). A Program requirement will be that all projects have an IRR of 10% or higher, which is roughly equivalent to a total resource cost benefit-cost ratio of 1.0 or greater. It is TRC's experience that C&I projects typically do not have difficulty in meeting this cost effectiveness threshold. By requiring a minimum IRR for the total project, participants can include less cost effective measures provided that other measures balance out the project. This approach allows the participant additional flexibility and can result in projects with more innovative measures.

### 3.3.1. Promote Market Transformation

TRC is a leader in developing and implementing programs that take a comprehensive approach to energy efficiency. As the industry shifts to offering efficiency programs that result in deeper savings, TRC is at the forefront in designing programs that focus on whole building strategies via state-of-the-art building simulation modeling linked directly to project financing and construction. TRC understands that precise energy modeling alone will not deliver energy savings, it must be connected to a cost effective work scope that a building owner is motivated, and capable, of implementing. Through the proposed New Hampshire P4P Program, TRC will deliver a network of Program Partners that are qualified to provide the turn-key services required to take projects from the energy audit to construction and on to the post-construction verification of projected energy savings. In some cases, an efficiency firm may offer all of the necessary services (e.g., an ESCO) however, firms that specialize in energy auditing and/or building modeling will be encouraged to team with firms that provide construction project management and site inspection services. In similar program designs in NY and NJ, TRC has seen this occur and the result is that the firms become more skilled in providing full efficiency services and participants are better served.

The Program will launch with a network of approved Partners but admission to this network will be open to new Partners on rolling basis. This market-based approach is effective in creating "green collar" jobs and helps to develop the workforce necessary to achieve ambitious energy savings targets. The Partner network is also designed to promote stronger relationships between Partners and building owners. The key relationship in the market is between Partners and owners. This approach requires that Partners act as the owner's agent for the entire energy project, from the initial meeting to construction completion and beyond.

EPA recognizes the importance of whole-building energy efficiency programs and has recently launched the Building Performance with ENERGY STAR pilot initiative. The New Jersey P4P Program is part of the national pilot rollout of this program. EPA modeled several facets of this new program after the P4P Program. TRC will leverage its involvement in this innovative national pilot in developing the final program design for the New Hampshire Program.

### 3.3.2. Innovative Technologies

This Program design is focused on delivering energy savings and is not restricted to a specific set of measures. Through regular communications with Program Partners TRC will provide "Tech Tips" on innovative technologies or strategies. In similar initiatives, TRC has observed innovative technologies, including:

- Energy Recovery Systems
- Advanced Thermal Shell Materials
- New Lighting Technologies (LED/Induction/Advanced Controls)
- EMS/BMS
- Combined Heat & Power (CHP)

### 3.3.3 Economic Development

During final Program design, TRC will collaborate with the NH Department of Resources and Economic Development and potentially other State agencies to determine targeted areas of initial Program marketing. The Program is anticipated to create an estimated sixty (60) jobs or more based on the expected construction costs. This figure is highly volatile and based on the American Council for an Energy Efficient Economy's (ACEEE) Stimulus Jobs Calculator Tool released in July 2009.

### 3.3.4 Reduced Energy Costs

The Program is anticipated to reduce source energy consumption by a minimum of 15% for each project funded. Based on the annual and cumulative energy savings values calculated in Section 3.1, the proposed Program would result in estimated energy cost savings of **\$2.1 million in electricity and \$800,000 in fuel savings\*** annually. Based on an average 15 year measure life for most equipment, and not accounting for increased energy costs, a conservative estimate of **\$43.5 million** in cumulative energy savings can be expected. [\*Estimated blended electric rate (\$0.16/kWh) and fuel rate (\$15.00/MMBtu)]

### 3.4 Best Practices

TRC will provide regular communications with the Partners throughout the Program, including monthly Partner conference calls. Through these communications, Partners will share ideas and TRC will raise awareness and provide training opportunities. In addition, Program documentation will include detailed guidelines on appropriate modeling techniques, typically installed measures and innovative energy efficient solutions to assist Partners on all projects. TRC utilizes public resources from the EPA and the U.S. Department of Energy national programs to keep Partners up to date on emerging technologies and innovative solutions. TRC will publish case studies of select completed projects so customers of similar size may implement similar effective measures for their buildings.

### 3.5 M&V Compared to Goals

The inherent design of the program allows for numerous instances where the energy savings estimates are reviewed and confirmed. Please see Section 4.0 for specific details on TRC's extensive M&V approach.

### 3.6 Promote Collaboration

The TRC Team is dedicated to providing the NH PUC a collaborative program to successfully promote energy efficiency throughout the State. TRC has significant experience in effectively leveraging multiple funding sources resulting in larger, more comprehensive work scopes.

As part of the ERP, the Partner will work with the building owner on how the proposed project will be financed. Program Partners will be trained on the available funding sources, including all electric and gas utility programs, the Community Development Finance Authority's (CDFA) Enterprise Energy Fund, and potentially other relevant initiatives. The ERP will clearly state how each project is funded so that TRC can effectively track all funding sources. TRC will include a Program limitation on total incentive funding from all sources not to exceed 75% of total project cost (specifics to be reviewed with the PUC during final Program design).

TRC will work with the following groups, at a minimum, during final Program design to allow for their input and buy-in:

- PlanNH ([www.plannh.org](http://www.plannh.org))
- Business and Industry Association ([www.nhbia.org](http://www.nhbia.org))
- NH Gas and Electric Utilities (PSNH, Unital, National Grid, NH Electric Cooperative)

## 4.0 MEASUREMENT & VERIFICATION (M&V)

This section describes how the Program performance will be measured and verified against the goals and program benefits.

The M&V methods proposed for the P4P Program are adopted from those defined in the 2009 International Performance Measurement and Verifications Protocol (IPMVP) and the 2008 Federal Energy Management Program (FEMP) M&V Guideline version 3.0. Four basic options are outlined in the IPMVP. Option D must be followed for all projects in the P4P Program. M&V protocols for Options A and B may be used as guidelines for data collection and all metering results will be used to calibrate the simulation model. Option C is not applicable for this Program.

Option D – Calibrated Simulation involves using software to create a simulated model of a building based on blueprints and site surveys. The model is calibrated by comparing it with billing or end-use monitored data. Models of the project are typically constructed for (1) the existing base case, and (2) a case with the energy measures installed.

The following table indicates the several points throughout the Program where TRC conducts M&V reviews.

### NH Pay for Performance Program – Points of M&V

Program Milestone	M&V Action
Program Application	Eligibility is verified based on completed application and actual utility bills.
ERP	Level 1 Review – Administrative check that all required data is provided and is accurate Level 2 Review – Detailed technical review of ERP including review of simulation model input, comparison of existing conditions to proposed improvements, review of Portfolio Manager inputs and outputs, check of cost values, and review for potential missed opportunities.
Pre-Construction Site Visit	Verify existing conditions as modeled, verify facility square footage per Application, and verify owner commitment to project.
Post-Construction Site Visit	Verify equipment and associated quantities installed as per the approved ERP, verify quality of installation, and run diagnostic tests of controls (EMS, VFD), perform other Commissioning as applicable to measures installed.
Post Construction Benchmarking Report	Verify actual savings through review of EPA Portfolio Manager inputs and outputs and actual utility bills.

P4P will use EPA’s *Portfolio Manager* to develop the pre- and post-benchmarks of the building, which will be used to verify that the minimum 15% source energy reduction target has been achieved. A post-construction benchmarking report is a clear and succinct way of demonstrating energy savings in a building. As an added benefit, if the post-construction benchmark indicates that the building received an energy performance score of 75 or higher, the building may be eligible to receive ENERGY STAR Certification. Additionally, *Portfolio Manager* can be used quantify and track savings in terms of Greenhouse Gas Emissions in MtCO<sub>2</sub>e/year.

## 5.0 BUDGET EXPLANATION

This section provides the Budget Worksheet (on the following pages), as well as details on key personnel including position, rates, and hours. We have also provided details on our fully-loaded costs, indirect cost rates, general overhead and profit.

### 5.1 Proposed Budget

See GHGERF 2010 RFP Budget Worksheets on the following pages.

### 5.2 Details on Key Personnel

Please see table in Section 2.1.2 for a summary of key staff roles, rates, and hours.

### 5.3 Indirect Cost Rates and Performance Contingency

Attached please find TRC's most recent (June 30, 2009) independent audit report related to our fringe benefits and general overhead.

### 5.4 Other potential funding sources

As described in Section 3, TRC anticipates that the \$4.3 million in RGGI-funded incentives will leverage an additional \$6.5 million in the participant's share of construction funding. In addition, we fully expect that electric and gas utility funding, and other potential funding sources, will be leveraged through the P4P Program. We cannot accurately estimated the amount of funding that may be leveraged through utility-funded efficiency programs but would conservatively expect that 10% of project costs, or \$1 million, may be leveraged. This would result in additional RGGI funding for projects through the P4P Program.

NH PUC Greenhouse Gas Emissions Reduction Fund 04-30-10 RFP Proposed Budget Worksheet

Program Title:

New Hampshire Pay for Performance

Applicant Name:

TRC

REQUESTED AMOUNTS FOR PROGRAM

USE OF FUNDS	Year 1					Year 2					Year 3
	Q1	Q2	Q3	Q4	Total Year	Q1	Q2	Q3	Q4	Total Year	Total Year
<b>EXPENSES</b>											
Salaries & Wages	████	████	████	████	████	████	████	████	████	████	
Benefits/Fringe**					\$0					\$0	
Contracted Labor & Services					\$0					\$0	
Rent & Utilities**					\$0					\$0	
Advertising & Marketing**					\$0					\$0	
Travel & Mileage Reimbursement	████	████	████	████	████	████	████	████	████	████	
Tools, Supplies, Subscriptions	████	████	████	████	████	████	████	████	████	████	
Other Current Expenses* (such as office expense, insurance, maintenance, repairs, taxes, legal, etc.)					████					\$0	
Cost of Goods Installed					\$0					\$0	
General Overhead & Profit*	████	████	████	████	████	████	████	████	████	████	
<b>TOTAL EXPENSES</b>	████	████	████	████	████	████	████	████	████	████	\$0
Capital Invested in Building Improvements					\$0					\$0	
Funds used for Loan Fund capital					\$0					\$0	
Loan Fund credit enhancement (such as interest rate buy-down)					\$0					\$0	
<b>TOTAL USE OF FUNDS</b>	████	████	████	████	████	████	████	████	████	████	\$0
<b>SOURCES OF FUNDS</b>											
Applicant Cash Contribution					\$0					\$0	
Applicant In-kind Contribution					\$0					\$0	
Program Participant Contribution	\$0	\$863,967	\$863,967	\$863,967	\$2,591,902	\$971,963	\$971,963	\$971,963	\$971,963	\$3,887,853	
Loans & Other Financing					\$0					\$0	
Forward Capacity Market Payments					\$0					\$0	
Other Grants					\$0					\$0	
<b>GHGER Fund (this proposal)</b>					<b>\$2,500,000</b>					<b>\$2,500,000</b>	
<b>TOTAL SOURCES OF FUNDS</b>	\$0	\$863,967	\$863,967	\$863,967	\$5,091,902	\$971,963	\$971,963	\$971,963	\$971,963	\$6,387,853	\$0

GHGER Funds as a % of TOTAL

49%

39%

Note: for General Overhead & Profit, please indicate to what extent any amounts are proposed to be contingent on program performance.

\*\*These items are included in the General Overhead & Profit line item

**STATEMENT OF DIRECT LABOR,  
FRINGE BENEFITS & GENERAL OVERHEAD  
AND  
INDEPENDENT AUDITOR'S REPORT**

**TRC COMPANIES, INC.**

**June 30, 2009**

**MACCONEL & DODD, LLC**

*Certified Public Accounting Firm*

PO Box 698  
Cortez, FL 34215  
(941) 794-1608  
Fax: 794-1657

## 6.0 APPLICANT QUALIFICATIONS

For the purposes of the RFP, this section provides a brief summary of our experience, proposed staff and program partners. Additional qualifications can be provided at the request of NH PUC.

### 6.1 Prior Experience

TRC launched the C&I P4P Program in March 2009 as part of the NJ Clean Energy Programs. After one year, the Program has proven very successful. There are currently more than 90 Program Partners and over 100 projects in the pipeline. TRC also assisted in the design and has managed the NYSERDA Multifamily Performance Program (MPP) for the past three years. MPP is a very similar program design that focuses on multifamily buildings and won the ACEEE Exemplary Program Award in 2008. More detail on the NJ Program and brief samples of work are provided in Appendix C – New Jersey’s P4P Program.

#### 6.1.1 Personnel Qualifications

Skills and qualifications for the following staff are provided in Appendix D Resumes.

Name	Title	Prior Relevant Experience
Tom Rooney, CEM, LEED AP	Program Manager	Led the Design of NJ P4P Program, Deputy Program Manager of NYSERDA MPP Program.
Michael McQueeney	Deputy Program Manager	Managing ERP’s for 7 NH multifamily projects; Managed PSNH direct install program, 25,000+ participants, \$15+ million in project costs.
Heather Healey, PhD	QC Engineering	Reviewed 60+ MPP and P4P ERP’s; Developed P4P technical protocols/requirements.
Daniel Mastin	QC / Field Inspections	Reviewed 150+ NYSERDA ARRA app’s
Ty Tafel, CEM	QC Engineering	Developed inspection plan and forms for NY ARRA
		Reviewed 300+ ERP’s.
Tom Page, CEM, CEA	QC Eng. / Field Inspections	Reviewed 232 LGEA audits; Reviewed 39 NH EECBG app’s; 100+ C&I installation inspections
Erik Monostory	QC Engineering	Reviewed 100+ NY ARRA Projects
Vihbuti Agarwal	Case Manager / Engineer	Intake & management of 271 NH EECBG applications; Benchmarked 45 NH school facilities.
Rhonda Harmych	Incentive Processing / Invoicing	Approved & processed approx. 4,000 incentive checks totaling almost \$40 million.
Shannon Russell	Senior Software Architect	Designed and developed NH EECBG database.
Michael McDonald	Programmer	Performed 100+ Level 1 Reviews for NY ARRA Projects; Assisted in development of NH EECBG database.

### 6.2 Subcontractors

Details on TRC’s Program Partners, contact information, and role for this Program are provided in Section 2.2 Key Partners/Allies.

#### 6.2.1 Subcontractor’s Organization and Abilities

TRC does not propose any subcontractors on this project. Program Partners will not contract with TRC.

### 6.3 Criminal Convictions

TRC and its staff do not have any criminal convictions in the last five years.

# APPENDIX A LETTER OF SUPPORT



May 25, 2010

Jack Ruderman  
Director, Sustainable Energy Division  
Public Utilities Commission  
21 South Fruit Street, Suite 10  
Concord, NH 03301

Subject: Letter of Support for New Hampshire Pay for Performance Program

Dear Mr. Ruderman,

Investment Engineering intends to join the New Hampshire Pay for Performance Program as a Program Partner. Investment Engineering is a strategic engineering consulting firm serving industry, commerce, institutions and multi-family housing. We evaluate, design, and commission new construction and existing buildings for optimized performance and operational efficiency.

We delivered the most savings and largest projects in the pioneering programs in Maine in the 1990s. The program paid for metered savings, thus leading to our culture of commissioning and verified savings. Attached is information on our firm with case studies of verified savings, commissioning projects and a project vita showing depth and satisfied, repeat clients.

Investment Engineering currently provides services under the New Jersey Pay for Performance Program, which TRC manages on behalf of the NJ Office of Clean Energy. We encourage you to strongly consider the Pay for Performance Program for the State of New Hampshire as it offers a tested program design model for addressing comprehensive energy savings projects in large commercial and industrial facilities.

We look forward to developing cost effective energy efficiency projects for large commercial and industrial facilities in New Hampshire through this innovative program design.

Respectfully,

Matt Holden, P.E., LEED-AP  
President, Investment Engineering

## **MATTHEW L. HOLDEN**

Investment Engineering: President and Professional Engineer, January 1990 to present

### **Expertise**

Provide mechanical engineering and construction services to institutional, commercial and industrial clients.

- Design robust mechanical systems to support operations at minimum costs.
- Use data logger and hand held instruments to clearly document the design criteria and energy use.
- Clearly document present and proposed system operation with process flow diagrams. Diagrams show design conditions, flows and process conditions to document the design.
- Remain involved from concept, construction, start up and operation to support the clients need to have a fully functional system within the shortest time span.

Design of robust industrial and commercial utility systems that are innovative in improving the processes while reducing cost of utilities. Most projects have been retrofits to existing systems and processes. Extensive experience in all mechanical utilities. Specific expertise in HVAC, chilled water, steam plants, condensate system, compressed air systems, process cooling and heating water and vacuum systems.

Provide value in commissioning services in multifamily, K to 12 schools, institutions and commercial. Commissioning for LEED requirements, but more importantly for energy efficiency and comfort immediately upon occupancy.

Provide energy audits to provide cost effective solutions to institutional, commercial and industrial clients.

### **Accomplishments**

- Completed projects with total savings over 50,000,000 kW-hr per year of savings with rebates from electric power utility exceeding \$4,000,000.
- Completed commissioning projects that bring the owner, design team and construction team into a unified goal of schedule and optimal start up. Improve the owners experience and minimizes call backs for construction team.
- Designed 30 energy efficient heating systems for multi family housing, each serving over 200+ units
- Designed 1000 ton chilled water plant with 300 ton process load and 40,000 cfm make up air load.
- Redesigned clean room air handling system to reduce power use by 40%.

## **Professional Service and Registration**

- Leadership in Energy and Environmental Design (LEED), Certified Engineer, U.S. Green Building Council
- Certified Energy Manager, Association of Energy Engineers
- Certified Building Commissioning Professional, Association of Energy Engineers
- Professional Engineer in the States of: Maine, New Hampshire, Massachusetts, Pennsylvania, New York, Michigan, New Jersey.
- Chairman, Energy Management Committee, Maine Chapter of ASHRAE 1987 to 1990.
- Chairman, Energy Management Committee, Mississippi Valley Chapter of ASHRAE, 1985.

## **Education and Honors**

First Place, ASHRAE Energy Design Contest, Industrial Process Category, Mississippi Valley Chapter, 1985.

Principal and Co-Principal investigator on federal, state and private grants relating to masters thesis. Supervised research team with total expenditures of \$200,000. Full scholarship for Masters degree.

U.S. Department of Energy, one of twelve engineering graduate students annually selected for two week seminar/tours of top ten Department of Energy research facilities.

Second Place, American Society of Mechanical Engineers, National Student Design Contest, 1980.

Undergraduate Research Participation Scholarship, full tuition, 1976 to 1980.

M.S. Mechanical Engineering, 1982, the University of Iowa, Iowa City, Iowa

B.S. Mechanical Engineering, 1980, the University of Iowa, Iowa City, Iowa



May 26, 2010

Jack Ruderman  
Director, Sustainable Energy Division  
Public Utilities Commission  
21 South Fruit Street, Suite 10  
Concord, NH 03301

**Subject: Letter of Support for New Hampshire Pay for Performance Program**

Dear Mr. Ruderman:

It is anix, LLC's intent to join the New Hampshire Pay for Performance as a program partner. Anix is a full service New Hampshire based engineering firm providing energy services to municipalities, the federal government, and private commercial entities.

We encourage you to strongly consider the Pay for Performance Program for the State of New Hampshire as it offers a tested program design model for addressing comprehensive energy savings projects in large commercial and industrial facilities.

We look forward to developing cost effective energy efficiency projects for large commercial and industrial facilities in New Hampshire through this innovative program design.

Regards,

A handwritten signature in black ink, appearing to read "TD Nichols".

Timothy D. Nichols, P.E., LEED-AP  
Principal, anix LLC

# APPENDIX B EEO POLICY

### **EQUAL EMPLOYMENT OPPORTUNITY AND AFFIRMATIVE ACTION POLICY**

TRC is an Equal Opportunity and Affirmative Action employer, and it is the policy of TRC to ensure equal employment opportunity to all job applicants and employees and to make employment-related decisions based upon qualifications and ability without regard to race, color, creed, religion, sex, national origin (including those for whom English is a second language or who are legal immigrants), ancestry, age, gender (including pregnancy, childbirth or related medical conditions), sexual preference, sexual orientation, genetic information, marital status, political affiliation, physical disability, mental disability, medical condition, veteran status, citizenship status, family responsibilities or any other basis protected by local, state or federal laws. TRC will recruit, hire, assign, transfer, promote, train, compensate, provide benefits, and administer programs without regard to the foregoing considerations. TRC will strive to provide a work environment free from discrimination and harassment based on any of those factors and also prohibits retaliation against any applicant or employee who complains about discrimination or harassment.

### **ADA: DISABILITIES AND ACCOMMODATIONS**

It is the policy of TRC to comply with all applicable federal, state, and local laws designed to provide equality of opportunity to disabled job applicants and employees. This policy applies to all employment-related decisions in recruitment, job application procedures, hiring, advancement, promotions, job terminations, compensation, training, and assignments. TRC will provide reasonable accommodations to qualified individuals with disabilities in accordance with applicable law.

# APPENDIX C

## NEW JERSEY PAY FOR PERFORMANCE PROGRAM – SAMPLE WORK PRODUCTS

**New Jersey's Clean Energy Program**  
**Pay for Performance**  
**Partner Conference Call**

May 26<sup>th</sup>, 2010  
10:00-11:00am (EST)

**Conference Call:**

Call-in #: 866-208-4552

Access Code: 6415751

**Webinar:**

[www.webmeeting.att.com](http://www.webmeeting.att.com)

Meeting Number: 8662084552

Access Code: 6415751

Log on as a "Participant"

*Please use your mute button to reduce background noise.  
(Use mute button or select \*6 to mute, \*7 to unmute)*

**1. Program Statistics**

A. Application Status:

- i. 113 projects in the system
- ii. 86 approved to date; remaining are under review.
- iii. Applications Approved by Type:
  - Colleges/Universities – 7
  - K-12 Schools – 21
  - Multifamily (Market & Affordable) – 20
  - Medical Centers/Hospitals – 5
  - Hospitality/Casino/Convention – 5
  - Warehouses/Storage – 7
  - Commercial Office Space – 12
  - Industrial - 4
  - Water Treatment Plants -1
  - Religious Institutions –3
  - Supermarkets -1

B. ERP Status

- i. 30 ERPs submitted
  - 8 ERPs approved
  - 22 ERPs under review

C. Fun facts

- i. Average incentive per project \$350,000
  - Lowest is \$50,000
  - Highest \$1.5MM
- ii. Incentives average 40% of total project cost

## 2. Program Announcements

### A. Sample ERP

- i. Sample ERP Packet included with Agenda email. Includes:
  - Sample ERP Report
  - Sample ERP Tables
  - Sample Model Calibration Tool
  - Expanded flow chart on Successful ERP Completion.
- ii. PLEASE USE THESE FILES TO HELP YOU DEVELOP A GOOD ERP. The better the ERP the faster the approval will be.

### B. Building Performance with ENERGY STAR

- i. National program launched by ENERGY STAR.
- ii. Commercial & Industrial version of the Home Performance with ENERGY STAR program.
- iii. NJ Clean Energy Pay for Performance Program encompasses all the requirements outlined by ENERGY STAR and will be a pilot program Participant.
- iv. Pay for Performance will now have a “Building Performance with ENERGY STAR” component.
  - What does this mean to you?
    - a. Extended marketing opportunities to leverage P4P as a State incentive program that meets national energy program requirements.
    - b. No additional incentives are available as a result of this.
- v. Press release document attached to email
- vi. Stay tuned for full details on how your projects can get involved.

### C. Increased Incentive Levels

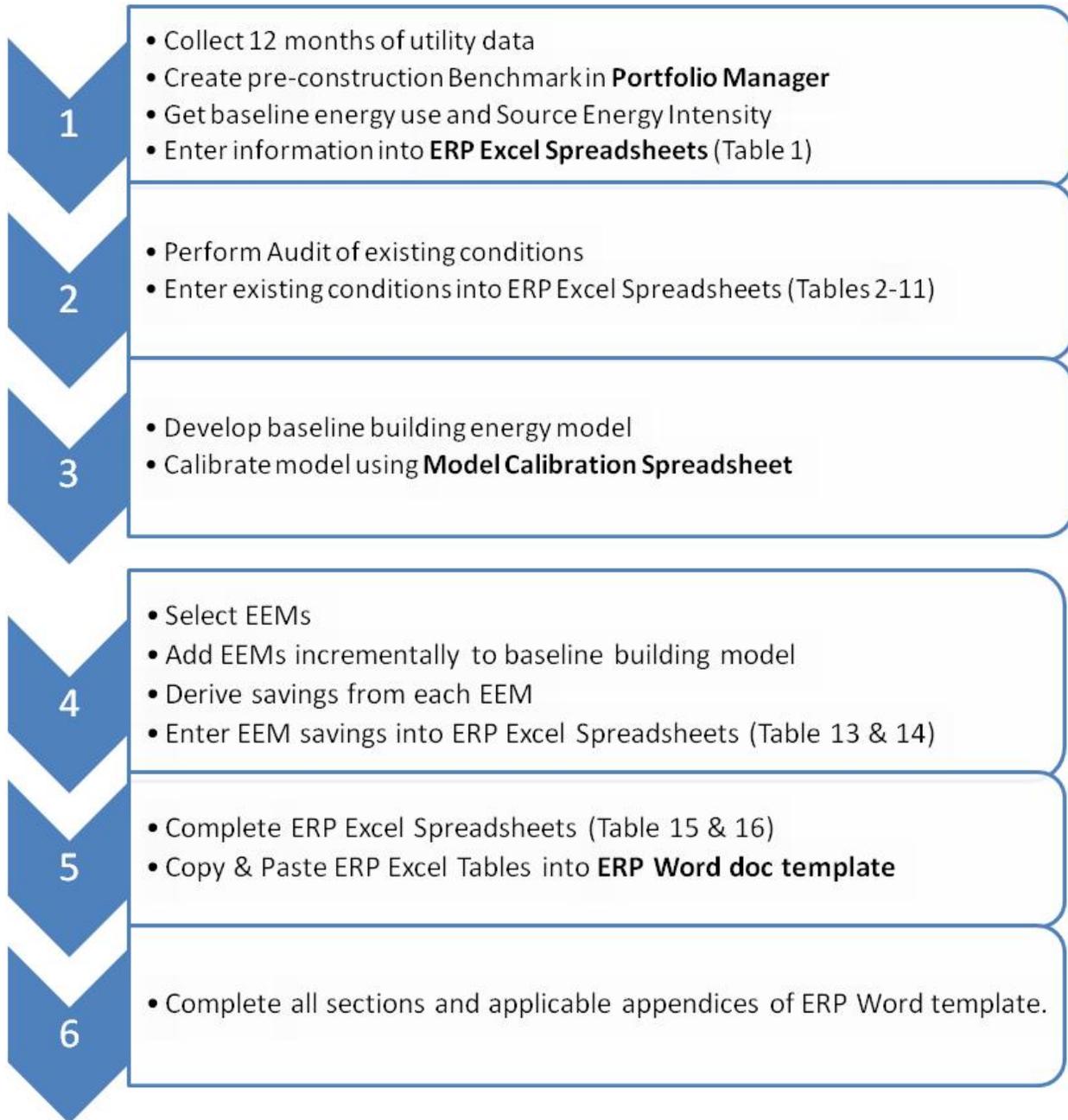
- i. As of Friday (May 21<sup>st</sup>) increased incentive levels will no longer be available for new projects.
- ii. All Applications approved and ERPs received prior to this date will be grandfathered in.
- iii. All Applications received, but not yet approved, prior to the deadline will be reviewed for completeness.
  - If application is complete you will receive an approval letter which will grandfather that project.
  - If application is deficient you will be notified.

## 3. Q&A

- A. Forward all future questions and points you'd like to discuss to [P4P@trcsolutions.com](mailto:P4P@trcsolutions.com)

**Next Partner Conference Call will be  
Wednesday June 23<sup>rd</sup> 10:00-11:00am (EST)**

## SUCCESSFUL ENERGY REDUCTION PLAN COMPLETION





**SAMPLE ENERGY REDUCTION PLAN APPROVAL LETTER**

<Date>

<Partner Name>

<Partner Company>

<Partner Address>

Dear (please use program partner name here)

Thank you for submitting your Energy Reduction Plan (ERP) to the Pay for Performance Program, an energy efficiency program sponsored by New Jersey’s Clean Energy Program. We are pleased to inform you that the ERP for the project listed below has been approved.

This incentive commitment is valid until the expiration date indicated below and is subject to the availability of Program funds. The installation of recommended measures must be completed, and supporting documentation submitted to the Program Manager by the expiration date or the Program commitment to you may expire.

<b>Application #:</b>	<b>Project Name/Location:</b>	<b>Expires:</b>
-----------------------	-------------------------------	-----------------

<b>1<sup>st</sup> Incentive:</b>	<b>Estimated 2<sup>nd</sup> Incentive:</b>	<b>Estimated 3<sup>rd</sup> Incentive:</b>
----------------------------------	--	--

Please submit the following information in order to process your first incentive:

1. Request for Incentive #1 form
2. Installation Agreement
3. Partner-Participant Contract
4. Tax Clearance Certificate from the **State of New Jersey, Division of Taxation. No incentive will be paid without receipt of a valid Tax Clearance Certificate.** Certificates are valid for 90 days but may be renewed for up to 1 year. **If the Trade Name listed on your Tax Clearance Form does not match the Company Name on your application, please notify the Program Manager listed below. Otherwise, your Tax Clearance Certificate will not be matched with your application and will not be processed.** For questions regarding Tax Clearance Applications, please contact NJ Division of Taxation at 609-242-6400.

Upon completion of the installation of recommended measures, please submit the following information:

1. Completed Installation Report
2. Invoices for all recommended measures, which must be dated after the date of this approval letter, but prior to the expiration date. **The invoices should include a description of the equipment installed, quantity, and unit price (e.g. material price per fixture, motor, etc.). Material and labor should be indicated separately.** Please include the application number on the invoice.

Any changes in the work scope that change the overall project savings must be submitted as a revision to the ERP. The project must still achieve the 15% minimum in estimated annual savings after this revision. The project can proceed prior to receiving approval from the Program Manager, but the Participant cannot start/continue work on the revised measure(s) until they receive approval from the Program Manager. **Please refer to the Program Guidelines for additional information.**

If you have any questions, please contact the undersigned at 732-855-0033.

Very truly yours,

Valentina Rozanova  
Program Manager

Commercial & Industrial Market Manager  
New Jersey's **Clean Energy** Program  
c/o TRC Energy Services  
900 Route 9 North, Suite 104, Woodbridge, NJ 07095  
Toll Free – 866-433-4479 • Phone – 732-855-0033 • Fax – 732-855-0422

# APPENDIX D RESUMES

## **THOMAS P. ROONEY, CEM, LEED™ AP**

### **EDUCATION**

M.S., Environmental Studies, University of Massachusetts Lowell, 2001

B.S., Mathematics/Economics, University of New Hampshire, 1986

### **PROFESSIONAL REGISTRATIONS/CERTIFICATIONS**

Certified Energy Manager (CEM)

Certified Measurement and Verification Professional (CMVP)

LEED™ Accredited Professional

### **AREAS OF EXPERTISE**

Mr. Thomas P. Rooney, CEM, LEED™ AP has program management and technical experience in the following general areas:

- Energy Efficiency Program Design and Management
- Residential and Commercial Green Buildings
- Sustainability Assessments and GHG Inventory Analyses
- Energy Performance Contracting Projects
- Energy Auditing of Residential and Commercial Buildings
- Energy Efficiency Technical Potential Studies
- Energy Efficiency Program Impact and Process Evaluations

### **REPRESENTATIVE EXPERIENCE**

Mr. Rooney has more than 20 years of experience in the energy industry with a primary focus on designing, implementing, and evaluating energy efficiency programs. Mr. Rooney is Technical Director of TRC Energy Services and Deputy Program Manager of NYSERDA's Multifamily Performance Program along with supporting the management and implementation of New Jersey's Clean Energy Programs. His experience includes several years of energy efficiency project management for large performance contracts. During the past five years, Mr. Rooney has managed multiple projects concerning energy efficiency programs, including:

- Developed the incentive structure and technical documentation for NYSERDA's Multifamily Performance Program and the NJ Pay for Performance Program.
- Develop and manage quality control plan for Multifamily Performance Program, including technical review of Energy Reduction Plans
- Conducted energy assessments on numerous commercial buildings
- Technical consultant to New Hampshire's Rebuild NH Program, including comprehensive energy studies and ENERGY STAR® Benchmarking
- Managed Statewide Residential and Commercial Energy Code Training workshops for New Hampshire.
- Managed statewide energy efficiency technical potential studies for Connecticut, Vermont, New Mexico, and Utah

**TRC (Technical Director)**

Manage the technical aspects of the Energy Services division, including developing internal standards for energy efficiency analysis and quality control. Manage the engineering-level quality control of NYSERDA's Multifamily Performance Program, including the development of related program policies. Design and develop the NJ OCE Pay for Performance Program.

**GDS Associates, Inc. (Senior Project Manager)**

Managed technical potential analyses, commercial energy assessments, logic model development, benefit/cost analysis of energy efficiency programs, program planning, analysis, implementation and evaluation of electric and gas energy efficiency programs and renewable energy programs, and other energy industry policy, regulatory and planning projects.

**EUA Citizens Conservation Services, Inc. Project Manager**

Managed the development and construction of energy and water saving performance contracts. Conducted extensive energy audits for public housing throughout the United States. Managed project measurement and verification and ongoing training services for Citizens' clients.

**U.S. Environmental Protection Agency (Technical Sales Manager)**

Developed a long term sales strategy for the Energy Star Homes Program to meet goal of national market penetration of ten percent of all new homes by the year 2000. Developed a national ally network of utilities and building product manufacturers to further goals of Energy Star Homes Program. Played an integral role in the design and development of the technical and administrative aspects of the Energy Star Homes Program.

**Boston Edison Company - Demand Side Management (DSM) (Program Administrator)**

Managed residential DSM programs including: determining goals, developing budgets and RFPs, managing field staff and subcontractors, marketing, and developing business plans. Designed and developed a prescriptive residential DSM new construction program.

**Technical Supervisor - Demand Side Management**

Responsible for managing field implementation of Energy Fitness Canvassing Program, which conducted door-to-door installations of energy efficient materials, including customer education, in over 20,000 low-income customers' homes.

**Research Analyst - Rate Department**

Responsible for conducting various power supply and demand side economic analysis projects.

## **MICHAEL J. MCQUEENEY**

### **EDUCATION**

B.S. Energy Policy & Politics University of New Hampshire at Manchester, 1992

### **PROFESSIONAL REGISTRATIONS/CERTIFICATIONS**

EPA RRP Certified Renovator, R-I-18692-10-04051

Building Analyst, Written/Field Proctor BPI CAN05315

Certified Geothermal Installer, IGSHPA

### **AREAS OF EXPERTISE**

Mr. Michael McQueeney has program management and technical experience in the following general areas:

- Energy Efficiency Technical Expertise
- Program Administration
- Database Design
- Geothermal System Application
- Policy/Procedure Development
- Building Performance Troubleshooting
- Energy Usage Modeling
- Energy Consumption Analysis

### **ENERGY EFFICIENCY ADVOCATE & ANALYST**

Mr. McQueeney has had full accountability for overseeing all aspects of Home Energy Solutions, including ENERGY STAR Home Geothermal Option and EnergyCHECK programs. Apply strategic planning skills toward maintaining high quality standards in delivering energy efficient alternatives to customers. Train, mentor and supervise a cross-functional team of in all aspects of daily operations, playing an integral role in their development and performance. Track team productivity to ensure strong proficiency levels as well as critical compliance with internal policies, rules and regulations. Collaborate with staff to develop and administer budgets and authorize Purchase Orders. Liaise between other Utility companies, New Hampshire Public Utilities Commission, State and County Agencies to deliver mutually agreeable results. Conduct comprehensive research and analysis to determine current industry trends as well as the availability of alternative energy sources.

### **Public Service of New Hampshire, Energy Efficiency Program Administrator - Manchester, New Hampshire**

Mr. McQueeney developed and implemented an innovative online tracking system which accurately reflects program participation and energy saving performance, generates invoices. Created and delivered presentations on a broad range of topics at national conferences, including: Affordable Comfort Conference, International Ground Source Heat Pump Association Expo and

Conference, EarthLinked Geothermal National Sales Meeting. Designed and launched key marketing initiatives in support of bringing energy efficiency programs to residential and small commercial customers. Served as a Proctor written and field exams for Building Performance Institute's, Building Analyst certification. Created curriculums, planned course content and methods of presentation, and implemented efficient approaches to promoting student involvement in both classroom and extracurricular on the issues of Indoor Air Quality course for Lakes Region Community College.

**Public Service of New Hampshire, Energy Services Representative - Manchester, New Hampshire**

**SPECIALIZED TRAINING & ACCOMPLISHMENTS**

- First Geothermal Habitat for Humanity, 9.2002
- ACEEE Exemplary Utility Funded Low Income Energy Efficiency, 9.2006
- 2010 Biltmore Who's Who in recognition of professional accomplishments

**SELECTED PUBLICATIONS AND PRESENTATIONS**

McQueeney, M. J., "The Economics of Actual Geothermal Installations," *American Groundwater Trust, Leominster, MA, 7.2009.*

McQueeney, M. J., "How to Estimate Electric Usage," *Department of Energy Region I Conference and Crew Fair, North Conway, NH, 9.2002.*

McQueeney, M. J., "Indoor Air Quality," *North Country Homebuilders and Remodelers Assoc, Lancaster, NH, 9.2009.*

McQueeney, M. J., "Developing Databases for Energy Efficiency," *Affordable Comfort Conference, Minneapolis, MI, 4.2005.*

McQueeney, M. J., "PSNH's Geothermal Program Results," *IGSHPA Technical Conference and Expo, Chicago IL, 10.2000.*

McQueeney, M. J., "How to Sell Geothermal", *Earthlinked© Technologies Annual Sales & Technology Conference, Lakeland, FL, 2.2007*

**LEGISLATIVE TESTIMONY**

"How Geothermal Works." Presented to Energy and Environment Legislative Subcommittee of New Hampshire House of Representatives as part of the research for New Hampshire's Renewable Portfolio Standard. 3.2007.

## **HEATHER L. HEALEY, PhD**

### **EDUCATION**

- PhD, Civil and Environmental Engineering, Carnegie Mellon University
- Master of Engineering Management, Thayer School of Engineering, Dartmouth College
- B.E., Environmental Engineering, Thayer School of Engineering, Dartmouth College

### **AREAS OF EXPERTISE**

Ms. Heather Healey has experience in the following general areas:

- Environmental Engineering & Energy Research
- Economic and Optimization Modeling
- Research Project Management
- Alternative Energy Infrastructure
- Production & Delivery of Ethanol and Hydrogen
- Green and High Performance Design

### **REPRESENTATIVE EXPERIENCE**

Ms. Healey has experience in both the research and the teaching sides of environmental and energy engineering. She has performed research projects looking at infrastructure change and environmental impacts for alternative transportation fuels. In addition, she developed a economic optimization model for ethanol production and distribution in the United States and has studied alternative pathways for hydrogen production and delivery.

#### **TRC Energy Services, Energy Analyst – Ithaca, NY**

As an Analyst, Ms. Healey possesses knowledge of building systems, energy efficiency, green building and sustainability. She works collaboratively with clients to develop programs that promote energy efficiency and green building.

- Develops technical standards, protocols and requirements for energy efficiency and green building programs
- Performs energy audits, feasibility studies and reports
- Conducts site visits to verify installation and operation of technologies
- Utilizes energy modeling applications and spreadsheets to compare actual verses predicted energy savings
- Applies oral and written communication skills in both internal and external interactions
- Conducts team oriented, hands-on, client-focused projects.

#### **Carnegie Mellon University, Research Assistant, Green Design Institute – Pittsburgh, PA**

- Created method to use Input-Output Life Cycle Assessment to evaluate alternative transportation fuels

- Developed economic optimization model for ethanol production and distribution in the United States
- Evaluated environmental impacts of ethanol and hydrogen infrastructure systems
- Authored proposals and grants to fund research
- Actively participated in department and campus-wide discussions and decisions affecting graduate students
- Invited as guest lecturer in seminars and courses

**Carnegie Mellon University, Teaching Assistant, Department of Civil and Environmental Engineering – Pittsburgh, PA**

- Assisted professors for the following classes: Design and Construction, Life Cycle Assessment, Sustainable Case Studies, Fluid Mechanics

**ENVIRON International Corporation, Associate in Risk Assessment – Princeton, NJ**

- Conducted investigations and risk assessments for RCRA corrective action and superfund remedial action
- Developed and streamlined risk assessment calculation tools
- Managed project databases
- Supervised interns

**University of the Federal Armed Forces, Institute of Material Science, Research Assistant – Hamburg, Germany**

- Analyzed thermal spraying process parameters and effects on microstructure
- Pioneered study abroad program between Dartmouth College and German university

**PROFESSIONAL MEMBERSHIPS**

- Society of Women Engineers
- American Society of Civil Engineers
- International Society of Industrial Ecology

## **DANIEL J. MASTIN**

### **EDUCATION**

B.S., Economics, State University of New York at Albany, 2008

A.S., Engineering Science, Hudson Valley Community College, May 2006

### **AREAS OF EXPERTISE**

Mr. Mastin has general experience and expertise in the following areas:

- Construction inspection
- Quality control/Quality assurance testing
- Creative landscape design
- Retail Management

### **REPRESENTATIVE EXPERIENCE**

Mr. Mastin has been a successful employee of a large engineering firm in the capacity of a construction inspector. He has provided guidance and support to contractors to assure that construction, as well as design of facilities met the clients specifications. Mr. Mastin has also provided quality control/quality assurance testing of soils for the New York State Department of Transportation. His responsibilities included testing, the calibration of laboratory equipment, as well as assisting in researching and testing a non-nuclear density gauge.

#### **TRC Energy Services, Clifton Park Office - NY (Energy Analyst**

As an energy analyst, Mr. Mastin has been a consultant to the NYSERDA, working primarily on their Energy Smart Focus program. He has performed benchmarking and analysis services for numerous K-12 school districts and state agencies including a number of EPA Energy Star Labeled Building and Leaders award recipients. Mr. Mastin has served in a capacity to support New York State Agencies in their goal to reduce their energy consumption; his work has included providing an energy benchmarking study of the State University of New York System, as well as the New York State Department of Transportation.

#### **New York State Department of Transportation - Albany, NY (Transportation Construction Inspector)**

Mr. Mastin conducted sampling and testing of soil to be used in transportation construction projects statewide. The testing he performed included gradation, compaction, magnesium-sulfate soundness testing, moisture content, as well as Atterberg limits testing. Mr. Mastin was also charged with the calibration of laboratory equipment in keeping with American Association of State Highway and

Transportation Officials (AASHTO) standards. While with the state department of transportation, Mr. Mastin assisted in researching and testing a non-nuclear density gauge design meant to replace nuclear density gauges as part of United States Department of Homeland Security initiative.

**Clough Harbour and Associates LLP - Albany, NY (Construction Inspector Intern)**

Mr. Mastin inspected a variety of construction projects for compliance with design specifications and building codes. Projects Mr. Mastin inspected included the ground up construction of a raw water treatment plant, as well as a town hall which was seeking LEED certification as a sustainable structure. His responsibilities included working closely with project owners, contractors, and designers to ensure the project was completed on-time, on-budget, and on-spec, as well as mediating the stake holders competing interests.

## **RALPH E. TAFEL, CEM**

### **EDUCATION**

M.S., Energy Resources, University of Pittsburgh

B.S., Business Administration, University of New Hampshire

### **PROFESSIONAL REGISTRATIONS/CERTIFICATIONS**

Certified Energy Manager, Association of Energy Engineers

### **AREAS OF EXPERTISE**

Mr. Ralph E. Tafel, CEM has management and energy experience in the following general areas:

- Renewable Energy
- Forecasting
- Cost Control
- Lighting Systems
- Project Management
- Conservation
- Monitoring
- Commissioning
- Building Management Systems

### **REPRESENTATIVE EXPERIENCE**

Mr. Tafel is an energy management executive with achievements in design and implementation of cost-effective lighting, building control systems, and consolidated gas/electric utility purchases. He headed a program that implemented renewables for energy conservation and sourced and negotiated pricing for electric generation and transport gas-purchase contracts. Mr. Tafel has extensive knowledge of Andover, Novar, Trane, and Danfoss-EMC building management systems and has managed budgets to \$62M. Throughout his experience, Mr. Tafel has sourced and installed cutting-edge utility accounting systems, identifying \$10M of excess usage, and has organized multi-location aggregate power supply purchases, saving \$8M annually. Mr. Tafel has also installed new energy-saving light fixtures throughout a retail chain, achieving ROI in 13 months, and has implemented a four-year lighting retrofit, thus reducing electricity charges by \$2.2M annually.

### **Price Chopper, Manager of Energy Services**

Mr. Tafel developed and negotiated 122 store's utility supply contracts. He was responsible for forecasting and projecting annual utility budgets of \$62M. Mr. Tafel identified utility rebates and credits for all retrofit projects and recommended new energy conservation technologies and systems. He also developed lighting criteria and building automation specifications for new store construction.

**Kmart Corporation, Divisional Energy Manager, Eastern Region**

Mr. Tafel was responsible for programming and maintenance of 475 retail stores' energy management systems. He investigated and implemented generation supply and transport gas pricing and purchase contracts. Mr. Tafel designed and implemented lighting retrofits and headed new store energy system commissioning.

**ERI/Noresco (ESCO), Project Manager**

Mr. Tafel was sole Project Manager for the lighting retrofit portion of the Allegheny County Performance Contract. Responsibilities included site survey/audits, lighting design, equipment and supply procurement, organized staging areas for shipping/receiving of product, storage trailers and waste management. Other projects included Steel Valley School District and Pittsburgh Public Schools. Some of his other duties were to perform detailed lighting audits for potential performance contract clients, organize and generate work plans for sub-contractors, manage installation of sizeable lighting retrofit projects and identify energy saving opportunities for client's building sites.

**Energy Masters International, National Accounts Manager**

Mr. Tafel was responsible for initial energy surveys for potential clients. He identified energy saving opportunities for clients' building sites and assisted in proposal generation for each client. He also performed sales presentations to clients.

**Kmart, Energy Manager**

Mr. Tafel was the project manager for BMS installations and electric-to-natural gas conversions. Mr. Tafel was responsible for programming and maintenance of 450 retail stores' energy management systems. Mr. Tafel commissioned energy systems for the eastern region retail properties of Kmart. He also developed and generated proposals giving energy usage comparisons between existing and proposed equipment and strategies

**Energy Management Group, Inc. (ESCO), Director of Operations**

Mr. Tafel setup and organized the office format of Energy Management Group, Inc. He performed energy audits on buildings for prospective clients and entered energy audit information into the computer system, performed all necessary calculations, organized and completed the format of energy management proposals, and programmed all energy management microprocessors. Mr. Tafel was knowledgeable of lighting techniques and retrofits and organized work crews for installations. He also utilized PC Paint software to design floor plans of installations.

## **THOMAS PAGE, CEM, CEA**

### **EDUCATION**

M.A., Energy & Environmental Analysis,

Boston University – Center for Energy and Environmental Studies, Boston, MA

B.S., Physics, Rensselaer Polytechnic Institute, Troy, NY.

### **PROFESSIONAL REGISTRATIONS/CERTIFICATIONS**

CEM – Certified Energy Manager, Association of Energy Engineers, June 2007

CEA – Certified Energy Auditor, Association of Energy Engineers, October 2010

### **AREAS OF EXPERTISE**

Mr. Thomas Page is a Certified Energy Manager with experience in managing energy efficiency and alternative/renewable energy projects from inception through final commissioning. He has over 12 years experience in providing analysis and advice to commercial, industrial, and government clients on cost-effective “green” energy options and energy savings opportunities. Has also managed or consulted on many small-scale renewable, cogeneration, and distributed energy projects.

### **CURRENT RESPONSIBILITIES and RECENT ACHIEVEMENTS**

- Developed standards and rules for retro-commissioning for all buildings participating in for NJ Clean Energy’s new *Pay for Performance Program*.
- Currently involved in review and approval of energy audits/ proposals submitted to NJ Clean Energy’s *Local Government Energy Audit Program*. Has personally reviewed, critiqued, and approved, investment-grade audits for hundreds of municipal and county-owned facilities. These investment grade audit/proposals are to identify all cost effective energy efficiency and renewable opportunities.
- Designed the *Direct Install Energy Assessment Tool* used by all contractors participating in the *NJ Clean Energy Direct Install Program*. The spreadsheet tool is used to analyze energy usage of small commercial and industrial facilities, instantly calculate incentive amounts, generate contract documents, and upload data on the proposed projects to the statewide database.
- Co-author of *New England’s Global Warming Solutions*, a comprehensive report published by the Tellus Institute on greenhouse gas (GHG) emissions and mitigation strategies for the New England region. Co-wrote the report and modeled the economic and emissions impacts of mitigation strategies on the region’s electric sector and other major industries.
- Provided analysis and writing for a comprehensive report on statewide residential energy efficiency programs for *Efficiency Vermont*. Analyzed retail sales data for *Energy Star* compliant home appliances & lighting fixtures. Surveyed homebuilders and HVAC contractors, and made recommendations.

## **REPRESENTATIVE EXPERIENCE**

### **Tellus Institute, Boston, MA (Research Associate – Energy Group)**

Provided analysis and writing for more than a dozen institute studies on energy usage and environmental issues – from assessment of utility demand-side management plans to impacts of international emissions trading on global renewable energy markets. Researched and wrote on the development of new energy technologies, the impacts of new state and federal regulations, and current energy industry trends. Primary focus was on policies and measures to reduce greenhouse gas emissions. Made significant contributions to five large studies of regional GHG mitigation strategies, covering a total of 25 states in all. Developed spreadsheets and modeled environmental and economic impacts of different policy scenarios affecting regional electric supply and demand.

### **U.S. EPA, Region 1, Boston, MA (Environmental Protection Specialist)**

Provided detailed analysis of electric deregulation laws enacted by states in the New England region. Analyzed the potential impacts of state deregulation plans on federal environmental regulations and emissions targets. Briefed EPA policymakers on the effects of deregulation of the electric industry on federal air regulations. Represented EPA on the New England Tracking System (NETS) Project Advisory Committee to create a means to track environmental attributes of electric generation for the Regional Greenhouse Gas Initiative (RGGI).

### **Connecticut Light & Power, Conservation & Load Mgmt. Program, Berlin, CT (Program Administrator)**

Regularly managed up to 50 commercial and industrial energy efficiency projects at a time. Reviewed and approved approximately \$1 million in total incentive payments per year. Responsibilities: Analysis and approval of new energy efficiency projects, calculating costs & energy savings, writing energy efficiency contracts, site inspections, verifying customer and contractor compliance, and authorizing incentive payments.

### **Xenergy/KEMA Consulting, Inc., Burlington, MA (Energy Analyst)**

Conducted research on industrial energy usage, analyzed market trends for high-efficiency end-use technologies and new power generation technologies for industry and government clients. Prepared reports on industrial, commercial, and residential energy usage and energy efficiency measures and programs. Compiled market data on end-use technologies, prepared survey materials, surveyed industry leaders, and performed statistical analyses of data.

### **Independent Power Producers of New York, Albany, NY (Director of Research)**

Tracked changes to state and federal regulations and provided analysis of issues affecting the electric power industry in New York on behalf of over 100 small and independent generators of electric power. Compiled and analyzed data from member companies and utilities. Managed research projects and data requests from member companies, state agencies, and the press. Developed data tables and charts used in regulatory and legal proceedings, legislative lobbying, and public relations. Managed comprehensive database of more than 300 independent power projects in New York.

## **VIBHUTI AGARWAL**

### **EDUCATION**

Master of Engineering Management, Thayer School of Engineering, Dartmouth College, Hanover, NH, December 2009

B.E., Chemical Engineering, Birla Institute of Technology and Science (BITS) - Pilani, India, June 2007

### **AREAS OF EXPERTISE**

Ms. Vibhuti Agarwal has technical experience in the following general areas:

- Energy Efficiency & Block Grant Program Management & Planning
- Benchmarking facilities using EPA's Portfolio Manager
- Database Management and Report Production
- Contract Writing
- Federal Requirements for ARRA funded programs
- Measurement of Energy Consumption & Energy Data Analysis
- Marketing and outreach

### **REPRESENTATIVE EXPERIENCE**

Ms. Agarwal gained experience and keen interest in energy efficiency, energy conservation and energy utilization analysis through undergraduate coursework in Chemical Engineering, Master of Engineering Management at Dartmouth College and work experience at TRC Energy Services and Thermax Babcock & Wilcox. Her managerial coursework at Tuck School of Business including Marketing, Corporate Finance, Operations Management and Advanced Competitive Strategies helped her better understand the business of technology.

### **TRC Energy Services, Energy Engineer (Portsmouth, NH)**

Ms. Agarwal primarily works on the New Hampshire Energy Efficiency & Conservation Block Grant program funded by the American Recovery and Reinvestment Act and sponsored by NH Office of Energy & Planning. She also works on the New Hampshire EnergySmart Schools program. Some of her responsibilities include program and project management; contract writing, client and customer interaction, federal requirements compliance and marketing and outreach. More specifically, they include:

#### **New Hampshire Energy Efficiency & Block Grant Program:**

- Intake and management of 271 program applications totaling \$31.95 million
- Drafting and generation of 67 EECBG contracts with New Hampshire municipalities totaling \$6.6 million
- Site – inspections
- Database Management
- Organization Federal Requirements Compliance workshop for 110 attendees

**New Hampshire EnergySmart Schools program**

- Benchmarking and report generation of 45 school facilities in New Hampshire using EPA's Portfolio Manager and TRC's internal database
- Marketing and Outreach for program promotion

**Energy Engineer Intern (Ithaca, NY)**

At TRC, Ms. Agarwal gained valuable knowledge of energy efficiency programs, measurement and benchmarking of facility energy performance. Her responsibilities included:

- Analyzing pre- versus post-retrofit energy consumption pattern of existing multifamily buildings, which participated in the NYSERDA's Assisted Multifamily Program for improved energy efficiency, using Inverse Modeling Toolkit.
- Developed energy analysis spreadsheets using weather normalization process for the measurement of the adjusted utility usage and savings of existing buildings to assess their energy efficiency.
- Assisted in developing benchmarking tool for facility energy performance and generating benchmarking reports for setting energy savings goals under the New Jersey's Clean Energy Commercial and Industrial Programs
- Supported in developing incentives and guidelines for Energy Star appliances under the Electric Reduction in Master- Metered Multifamily Buildings Program
- Collaborated with NYSERDA's Assisted Multifamily Program participants and New York utility companies to acquire the post- retrofit utility data for measurement of energy consumption of the existing buildings

**Thermax Babcock & Wilcox, India (Engineer Trainee)**

- Developed Piping and Instrumentation schematics for absorption chillers in large scale chemical plants
- Analyzed budgets for material requirements worth \$3 million to plan the procurement process
- Performed root cause analysis for component failures and developed new component selection standards

**Publications & Presentations**

Intensification of Recovery of Nicotinic Acid using Reactive Extraction, BITS-Pilani, India

- Presented research work at Chemical Engineering Congress, Dec 2006, Bharuch, India
- Above research paper published: *Kumar S., Vibhuti, Babu B.V. and Wasewer K. L., "Intensification of Recovery of nicotinic acid using Reactive extraction: An Equilibrium study", Chemcon-2006, 59, Pg 187*

## **ERIK J. MONOSTORY**

### **EDUCATION**

M.B.A., Business Administration, University of Rochester, 2009

M.S., Business Management, University of Rochester, 2008

B.S., Mechanical Engineering, University of Rochester, 2006

### **AREAS OF EXPERTISE**

Mr. Erik J. Monostory has technical experience in the following general areas:

- Finance
- Engineering
- Strategy & Planning
- International Management

### **REPRESENTATIVE EXPERIENCE**

Mr. Monostory has over eight years of experience and progressive responsibility in environmental and mechanical engineering consulting. His qualifications include extensive hands-on planning and design, financial analysis, field investigation, permitting and project management. Mr. Monostory's background includes extensive service to private-sector clientele including the Newport Shipyard, University of Rochester Medical Center and Fleet Bank. He has also co-designed and received U.S. Patent #7,448,214 for *Geothermal Hydrogen Production & Method*.

#### **Hydrogen, Inc., (Co-Founder)**

Mr. Monostory served as President and project manager establishing an alternative for fossil fuels using only renewable resources to produce hydrogen fuel. His approach incorporated geothermal energy and water in order to produce safe, clean, low-cost hydrogen fuel and oxygen gas. Mr. Monostory applied for SBIR Grant with the Department of Energy and the technology received a U.S. Patent for the design and method for hydrogen production.

#### **Volt Technical Services/Apple Computers, Rochester, NY (Apple Campus Representative)**

Mr. Monostory was responsible for creating a link between the Apple corporate offices and University of Rochester community. His duties comprised of communicating directly to Apple Headquarters, marketing the Apple Education product line and website, which includes iPods, AppleTV, computers, hardware and software. He increased the products sold and market share of Apple computers at the campus store by over 200 Macs and from 49% to 68%, respectively.

#### **RepNation/Dell Computers, Rochester, NY (Dell Campus Representative)**

Mr. Monostory was responsible for promoting Dell computer products and available student discounts to the Rochester, NY region of colleges. His duties included communicating directly to Dell headquarters, marketing the Dell product line and the Microsoft Zune as well as repairing Dell computers for students.

## **RHONDA J. HARMYCH**

### **EDUCATION**

B.S., Business Management, State University of New York at Geneseo, 2004

### **AREAS OF EXPERTISE**

Ms. Rhonda J. Harmych has experience in the following areas:

- Energy Efficiency Program Invoicing and budget tracking
- Program Database Administration
- Reporting for Energy Efficiency Programs
- Project Coordination

### **REPRESENTATIVE EXPERIENCE**

Ms. Harmych supports several energy efficiency programs focusing primarily on budget tracking, billing, and program reporting as well as coordinating the work flow of administrative staff and project managers.

#### **New Jersey SmartStart Buildings Program – Boston, MA (Project Coordinator)**

Ms. Harmych serves as Project Coordinator for the Commercial and Industrial SmartStart Buildings Programs under the Office of Clean Energy's New Jersey Clean Energy Program.

#### **HarbourVest Partners, LLC – Boston, MA (Partnership Operations Assistant)**

Ms. Harmych aided the Partnership Operations Group of this private equity firm by tracking financial statements and notifying investment staff of all notices from partnerships.

#### **Ianniello, Anderson & Reilly, P.C. – Clifton Park, NY (Accounting Assistant)**

Ms. Harmych released all refinance funds, facilitated accurate mortgage payoffs, and cut final closing checks for this real estate law firm.

### **SPECIALIZED TRAINING**

- GreenBuild Conference, November 2008
- Affordable Comfort, Inc. Conference, October 2008
- Multifamily Performance Program Partner Conference, May 2008

### **PROFESSIONAL AFFILIATIONS**

- Environmental Business Council
- Young Professionals in Energy

## **SHANNON J. RUSSELL**

### **EDUCATION**

B.S., Aeronautical and Astronautical Engineering, Massachusetts Institute of Technology, 2001

### **AREAS OF EXPERTISE**

Mr. Shannon J. Russell has technical experience in the following general areas:

- Engineering and Data Modeling
- Scalable Software Design
- Web-enabled Interface Design
- IT Infrastructure Scaling

### **REPRESENTATIVE EXPERIENCE**

Mr. Russell has experience with engineering and data modeling, scalable software design and IT scaling gained through a combination of work experience at TRC and Care2.com, Inc and coursework in the Department of Aeronautical and Astronautical Engineering at MIT. While at Care2 he developed automated systems to streamline campaign workflows responsible for increasing throughput by 10x while cutting support costs. He also developed automated software generation tools which enabled faster software development, increased security, and decreased support costs for internal tools.

#### **TRC Energy Services, Senior Engineer – Clifton Park, NY**

Responsibilities include development of next generation software tools supporting projects within the energy benchmarking and program management fields aimed at improving consultant efficiency and decreasing the cost of managing projects while increasing project throughput. Current projects include improvements on benchmarking systems for the NY Energy Smart Focus Program and the New Construction and Existing Construction components of the Multifamily Performance Program (MPP), and upgrades to NYSERDA's Program Management Database (CRIS) and the SmartStart Database.

#### **Care2.com, Inc., Chief Architect – Redwood Shores, CA**

Responsibilities included the development of email delivery, database, and systems responsible for 80% of revenue; database scale-out to provide stability and performance; and code generation tools for improving developer efficiency while driving down support costs. Mr. Russell also provided training and mentoring to junior engineers, and provided operational support as needed.

**Surfprotect, LLC, Engineer – Cambridge, MA**

Mr. Russell designed, built and managed a web commerce system managing advertising affiliates; managed and extended an advertising system supporting more than one million impressions per day, and trained junior IT staff to take on full administrative duties.

**Venturefuge, LLC, Consultant – Cambridge, MA**

Mr. Russell managed development of thin-client (browser-based) Outlook replacement and built engineering models of catamarans designed to act as ferries on the routes between Hong Kong, Macau, and other ports on mainland China.

## **MICHAEL C. MCDONALD**

### **EDUCATION**

B.S., Business Administration: Information Systems Concentration,  
LeMoyne College, 2008

### **AREAS OF EXPERTISE**

Mr. Michael C. McDonald has technical experience in the following general areas:

- Web / Software Development
- Database Design and Management
- Team Based Project Management
- Systems Development Life Cycle
- Enterprise Resource Planning

### **REPRESENTATIVE EXPERIENCE**

Mr. McDonald has experience with software and database design, web-based development and technical team-based project management, gained through a combination of work experience at TRC and the Bank of New York Mellon as well as coursework in the Information Systems Program at LeMoyne College. He is knowledgeable in numerous areas including Operating Systems, Database Technologies, Networking systems, and numerous programming languages. He is serving as a web developer alongside another IT analyst and has helped with design and implementation of several web-based systems within Energy Services.

### **NYSERDA – Project Implementation Funding - State Energy Program American Recovery and Reinvestment Act (ARRA).**

He also is involved with many NYSERDA Programs including the Project Implementation Funding for ARRA. Mr. McDonald is involved with the Application Review Process and provides Technical support for most phases of the program. He is actively involved in Program and Database Design and implementation for a Program Management system that will help track applications and projects that receive funding through the ARRA Program as well as many other Energy Services programs that will be supported by this system.

### **Multiple Clients, – Clifton Park, NY (Energy Analyst/Web Developer)**

Responsibilities include involvement with the NYSERDA Energy Smart Schools Benchmarking Program, New Jersey Sector Specific Benchmarking Program and the American Recovery and Re-Investment Act (ARRA) Programs for New York State. Mr. McDonald has served as a web-developer in many Energy Services IT initiatives that have helped increase productivity in many programs. He, along with a senior level software architect, successfully designed and implemented a web-based Benchmarking system while upgrading the old system from an Access database to an SQL Server system with additional reporting capabilities.