

**Program Title:**

Reducing Residential Energy Consumption through the New Hampshire Carbon Challenge

**Program Type** (pursuant to PUC 2604.01(c))

1. Education, outreach and information programs that promote energy efficiency, conservation, and demand response.
2. Demand response programs to reduce New Hampshire's peak electric load.

**Program Summary:**

The New Hampshire Carbon Challenge (NHCC) is a University of New Hampshire (UNH) initiative committed to providing residents and communities with the information, tools and support necessary for New England households to make substantial reductions in their energy consumption and thus greenhouse gas emissions. The New Hampshire Carbon Challenge works to educate, inspire and support sustained reductions in household energy consumption by coupling innovative web-based tools with effective outreach strategies to households, businesses, schools, civic organizations, and faith-based communities.

**Low Income Residential Customer Qualification**

The New Hampshire Carbon Challenge provides resources and services to all New Hampshire residents, regardless of income status. Therefore, we anticipate 12% of this proposal budget will provide services and assistance to low income residents; reflecting demographic and income distribution data in the state.

**Identification of Applicant Organization**

**Applicant:** University of New Hampshire (Part of the University System of New Hampshire; a not-for-profit institution of higher education created in 1963 as a body politic and corporate under the laws of the State of New Hampshire)

**Contact:**

Dianne Hall  
Grant and Contract Administrator  
Phone: 603.862.1942  
[dianne.hall@unh.edu](mailto:dianne.hall@unh.edu)

**Address:**

UNH Office of Sponsored Research  
51 College Road  
Durham, NH 03824  
603.862.3750 (Ph)  
603.862.3564 (Fax)

**Identification of Subcontractors and Partners**

NH Sustainable Energy Association  
54 Portsmouth Street  
Concord, NH 03301  
Tel: (603) 22NHSEA (226-4732)  
**Contact:** Clay Mitchell, NHSEA Board President

## Authorized Negotiator(s)

### **Authorized Negotiator:**

Dianne Hall  
Grant and Contract Administrator  
Phone: 603.862.1942  
dianne.hall@unh.edu

### **Address:**

UNH Office of Sponsored Research  
51 College Road  
Durham, NH 03824  
603.862.3750 (Ph)  
603.862.3564 (Fax)

## Projected Energy Savings

The New Hampshire Carbon Challenge indirectly supports residential energy reductions through online tools that enable households to select, and then pledge to take, actions that will reduce their energy consumption. New tools developed under this proposal will facilitate even greater reductions in energy usage. Based on the actions of households that have taken the NH Carbon Challenge in the last two years and our projected growth in the next two years, **we estimate the electricity and home heating savings to be at least \$3.8 million per year by June 2011.** Most of the projected savings will likely occur in the second year after the release of our proposed web-based tools.

## Projected Greenhouse Gas Emissions Reductions

The New Hampshire Carbon Challenge indirectly supports residential energy reductions. Based on the actions of households that have taken the NH Carbon Challenge in the last two years and our projected growth in the next two years, **we estimate the electricity and home heating greenhouse gas emission reductions to be at least 12,080 metric tons of CO<sub>2</sub> annually by June 2011.**

## Length of Program

The New Hampshire Carbon Challenge program is expected to exist indefinitely. This proposal seeks funding for two years, with a new proposal for continued support anticipated in March 2011.

**Total Program Costs:**                    \$436,041 in YEAR 1    \$406,270 in YEAR 2

**GHGER Funds Requested:**            \$421,835 in YEAR 1    \$391,567 in YEAR 2

## EXECUTIVE SUMMARY

**Problem Statement:** Residential carbon emissions from vehicles, space heating, and electricity consumption account for roughly 40% of all US greenhouse gas emissions (US EPA; *Inventory of Greenhouse Gas Emissions and Sinks 1990-2007*) and thus reducing these emissions is essential to stabilizing our climate. Although states, municipalities, and businesses are taking notable action in reducing their emissions and federal policy changes are on the horizon, residential action to reduce emissions is still limited in scope. While numerous tools, resources and programs exist to help residents increase the adoption of energy efficiency and conservation measures, there are other more significant obstacles to behavior change that have largely prevented early and significant action in the residential sector. The New Hampshire Carbon Challenge (NHCC) is a University of New Hampshire (UNH)-based initiative that is specifically focused on providing residents and communities with the information, tools and support needed to overcome these obstacles to change and thus facilitate substantial reductions in energy consumption and greenhouse gas emissions by New England households. The New Hampshire Carbon Challenge couples innovative web-based tools with effective outreach strategies to households, businesses, schools, civic organizations, and faith-based communities to educate, inspire and support sustained reductions in household energy consumption.

**Accomplishments:** Since our inception in October 2006, we have developed a robust, web-based system to help New England households and communities estimate their carbon emissions, map out a plan to reduce their emissions, and chart their progress in achieving their personal emission reduction goals. This largely automated system, our New England Carbon Estimator™, can also link individual households together to document the progress of neighborhoods, towns, businesses, civic groups, or any organization taking collective action to reduce carbon emissions. A key attribute of the NHCC is its ability to reach mainstream NH residents, individuals who haven't typically been served by traditional environmental programming. Since October 2007, more than 1300 households in 240 New England towns have formally taken the Carbon Challenge, pledging to reduce their emissions by 4212 metric tons of CO<sub>2</sub>, through actions that will save them over a million dollars a year in reduced energy costs. An additional 6300 households have used our Carbon Estimator but have not formally taken the Carbon Challenge. Of our challenge takers, 67% live in New Hampshire, 30% in Massachusetts and 3% in the other New England states. We have seen a surge in the use of our web-tools: 500 households took the challenge from October 2007 through October 2008; an additional 800 households have taken the challenge in the last four months. The New Hampshire Carbon Challenge was featured recently in a December 2008 *Congressional Quarterly Researcher* article on individual efforts to reduce greenhouse gas emissions.

**Proposed Solution:** We will build on the foundation that we've established using the tools and strategies that have been shown to be effective in engaging residents to reduce residential energy consumption. We will enhance our existing tools and create a residential energy portal providing a new suite of web-based tools that enable households to use energy more efficiently and transition to sustainable energy technologies. Specifically:

- We will expand our outreach efforts to communities through the hiring of a full-time community coordinator who will provide direct assistance to communities in implementing the NH Carbon Challenge through public presentations, guidance on best practices, and reports on the community's progress.
- We will extend the capabilities of our New England Carbon Estimator™ to enable households to make even greater reductions in their energy usage through the creation of a customized "next steps" report sent to all challenge takers that links the actions they've indicated they want to take to available resources and incentives such as federal, state, municipal and utility rebates, as well as tax incentives for energy efficiency and renewable energy projects.

- We will provide households with easy to search information concerning home energy auditors and banks offering home energy improvement loans, and where feasible, track the impact of these recommendations (e.g., number of home energy audits, number of weatherization products purchased). One of the chief barriers to action is an overabundance of sometimes conflicting information. We will leverage our existing network of partners and institutional relationships to identify the other organizations, programs, and industries which provide goods and services that will help reduce the barriers to individuals actually implementing their chosen actions. In this way, we will be serving as not only the portal for the NH citizenry, but as a trusted resource that makes sense of the confusing, myriad of options for energy conservation and renewable energy.
- We will develop a "Home Energy Planner" (working title) that will assist households in planning their energy efficiency and sustainable energy projects over a 1 to 10 year time horizon and evaluate the projected costs and benefits. This tool would enable households to plan their energy reduction goals in line with the 3% annual reduction that is needed to achieve a 20% reduction in CO<sub>2</sub> by 2025.
- Partnering with the NH Sustainable Energy Association, we will create the "Green Homes Tourist" web system that links homeowners who have energy efficient/renewable energy system homes with residents who want to see these systems in place before they purchase these new technologies. Through its on-line scheduling and tour reservation service, Green Homes Tourist will pair these residents together, toward the end result of more informed consumer purchases of sustainable energy systems.
- Recognizing that a major obstacle to using energy efficiently is simply the cost, we will develop an "Incentive and Vendor Index" tool that gives residents a customized report on the rebates and incentives that are available to them from all sources to purchase energy efficient products and renewable energy systems and a listing of contractors who sell and install these systems.

**Potential Benefits:** The New Hampshire Carbon Challenge achieves objective I (f) in [RSA 12-O:5-a](#) and fulfills RCI Action 4.3 "*Reduce Residential Energy Demand through Education and Outreach*" as well as RCI Action 4.5, "*Create an Energy Efficiency and Sustainable Energy Systems Web Portal*" elucidated in the draft NH Climate Change Action Plan. By providing residents with concrete actions that can be taken in their home and using research-based tools that have been shown to be effective in prompting people to take these actions (D. McKenzie Mohr and W. Smith; *Fostering Sustainable Behavior*), the New Hampshire Carbon Challenge is reducing greenhouse gas emissions, reducing energy costs, promoting market transformations and innovative technologies. We estimate the projected annual CO<sub>2</sub> savings from the enhanced New England Carbon Estimator™ and our proposed new web tools to be at least 4560 metric tons of CO<sub>2</sub> from electricity consumption and 7520 metric tons of CO<sub>2</sub> reduced from home heating fuels. We estimate the projected annual energy cost savings to be \$1.37 million dollars in electricity costs and \$2.42 million dollars saved in home heating costs for the two year time period of this proposal.

**Total Program Cost:** YR 1: \$436,041 YR 2: \$406,270

**Requested GHGER Funds:** YR 1: \$421,835; YR 2: \$391,567

**Time Period for the Program:** The NHCC has developed the infrastructure, tools, and community networks essential to sustained reductions in residential energy consumption. The Carbon Challenge has a demonstrated track record in achieving emissions reductions at the household level in New Hampshire since 2006 and is ideally poised for expansion. This proposal seeks funding for the next two years.

**Key Partners and Allies:** NH Sustainable Energy Association; Carbon Coalition, Carbon Solutions New England; UNH Cooperative Extension Energy Answers. We have already met with representatives from NH's four utilities regarding linking our system enhancements to improve utilization of the utility CORE efficiency programs.

## PROPOSED WORK SCOPE AND SCHEDULE

### Web-Based Tools to Be Developed:

1. **Customized "Next Steps" Guide:** We will facilitate the reduction of energy consumption by creating a customized "next steps" document sent to all Challenge takers that will link the actions they've indicated they want to take to available resources and incentives such as federal, state, municipal and utility rebates and tax incentives for energy efficiency and renewable energy projects. We will also connect Challenge takers to home energy auditors and to banks offering home energy improvement loans. This next steps report could also include information about upcoming energy conferences and links to their Local Energy Committee. A key objective of this "next steps" tool is to not only move individuals into greater household action but to link them with greater personal action around energy/climate change efforts in their communities.

2. **Extend the Capabilities of the New England Carbon Estimator™:** We will enhance the capabilities of our New England Carbon Estimator™ to include actions the household has completed (as a result of taking the challenge) as opposed to what they pledged to do. This feature will enable households to track their current reductions in energy use, as well as their short-term (1 year) and mid-term (2-3 year) reductions, an essential element to the "Home Energy Planner" outlined in item #5 below. We will also add additional actions and features to the Estimator, including the ability to sort actions based on impact (of CO<sub>2</sub> reduced) and the level of difficulty to implement.

3. **Incentives and Vendor Index:** We will create a searchable web-based tool for incentives, rebates, and financing options for residential energy efficiency upgrades and renewable energy projects. The Database of State Incentives for Renewable Energy provides good information, but much of the information is scattered and fragmented on multiple web sites. We will build a "one-stop shopping" tool that produces a customized report tailored to homeowners' interests and eligibility (as defined through their utility provider and city of residence). Through our partnership with NHSEA, we will also provide access to a list of energy efficiency/sustainable energy technology contractors.

4. **Green Homes Tourist:** Partnering with NH Sustainable Energy Association, we will create a web-based system for locating and scheduling green home tours throughout the year and throughout the state. Currently, New Hampshire Sustainable Energy Association (NHSEA) has a very successful annual green homes tour. Building on this model, we will facilitate green homes tours all year long by connecting homeowners who have energy efficient homes with prospective buyers who want to "see, touch, and feel" the energy system they are considering purchasing before they buy. We will develop software and tools that will bring these two types of residents together toward the end result of more informed consumer purchases of energy efficient and sustainable energy systems.

5. **Develop a residential "Home Energy Planner":** Building on the Carbon Estimator, we will create a tool that will assist households in planning their energy efficiency and sustainable energy projects over a 1 to 10 year time horizon and evaluate the projected costs and benefits. This tool would enable households to plan their energy reduction goals in line with the 3% annual reduction that is needed to achieve a 20% reduction in CO<sub>2</sub> by 2025 and will be developed in close partnership with Carbon Solutions New England and Clean Air-Cool Planet. This tool addresses the need individuals have for guidance to such queries as, "How do I know if what I'm doing is enough?", "What is the payback period if I install a solar hot water system in 2010?" and "How much will I save if I add additional attic insulation?" The Energy Planner will likely be accompanied by a smorgasbord of incentives by participating sponsors such as rebates on conducting home energy audits, purchasing weatherization products, etc.

## **Technical Work Plan**

### **July 2009- September 2009**

1. Begin compiling data set of rebates, incentives, and vendors for the "Incentives and Vendors Index". Develop procedures to ensure dataset is kept current. (McElaney 5 weeks; Blaha 2 week).
2. Convene a volunteer advisory group of residents and representatives from our partner organizations to provide guidance on the development of our proposed web-based tools. Determine a meeting schedule and/or means to provide feedback. (Blaha coordinates advisory group; 2 weeks/yr)
3. NHSEA develops survey of homeowners to determine interest/participation in the Green Homes Tourist program. (McElaney 3 weeks)
4. Identify modifications to be made to the Estimator (including "next steps" guide). Consult with graphics designer. Develop schema for these changes. (Armstrong 4 weeks; Blaha 5 weeks; Dundorf 2 weeks; Schloss 1 week; McElaney 1 week; graphics designer 2 weeks)

### **October 2009 - Dec 2009**

1. Graphics design of incentives tool. (0.5 week designer)
2. Advisory team provides input on proposed "Incentives and Vendor Index"
3. Create a searchable web-based incentives and vendor tool. (Armstrong 4 weeks; Blaha 1 week.)
4. NHSEA surveys homeowners to determine interest in the Green Homes Tourist program. Results compiled. (McElaney 4 weeks)
5. Advisory team provides input on proposed Estimator changes.
6. Begin coding changes to the Estimator (Armstrong 8 weeks; Blaha 2 weeks)

### **January 2010 - March 2010**

1. Review of the incentives tool by the advisory team. Modifications made to the tool, final beta testing followed by release of this tool. Advertise the availability of this resource. (Armstrong 0.5 weeks ; Blaha 1.5 weeks; Dundorf 0.5 week; McElaney 1.5 weeks)
2. NHSEA provides Green Homes data set to NHCC. NHSEA and NHCC determine key functionality and web interface design. (Armstrong 1 week; Blaha 1 week; Dundorf 0.5 week; McElaney 1 week)
3. Complete coding changes to the Estimator. (Armstrong 2 weeks)

### **April 2010 - June 2010**

1. Volunteer advisory team provides initial input on Green Homes Tourist.
2. Graphics design of Green Homes Tourist. (1 week)
3. Schema and coding of Green Homes Tourist. (Blaha 2 weeks; Armstrong 12 weeks)
4. Beta testing of Estimator. (Blaha 1 week; Dundorf 0.5 week; McElaney 0.5 week)
5. Advisory team provides final input on enhanced Estimator.
6. Final review and modifications of Estimator. (Armstrong 1 week; Blaha 1 week; Schloss 0.5 week)
7. Release of enhanced NE Carbon Estimator; advertising and marketing of Estimator. (Blaha 1 week)
8. Public training webinars to Local Energy Committees (LECs) on Incentives and Vendor Index and enhanced New England Carbon Estimator<sup>TM</sup>.

### **July 2010 - September 2010**

1. Beta test and review of Green Homes Tourist. (Blaha 1 week; Schloss 0.5 week; Dundorf 0.5 week; McElaney 1 week)
2. Modifications to Green Homes Tourist. (Armstrong 1 week)
3. Advisory team provides final input on Green Homes Tourist.
4. Public release and marketing of Green Homes Tourist. (Blaha 1 week; McElaney 2 weeks)
5. Public training webinars to Local Energy Committees (LECs) on Green Homes Tourist.
6. Story boarding of Energy Planner. (Armstrong 4 weeks; Blaha 5 weeks; Schloss 2 weeks; Dundorf 2 weeks; McElaney 2 weeks)
7. Develop schema for Energy Planner. (Armstrong 1 week; Blaha 1 week)

8. Initial review and feedback of Energy Planner. (Armstrong 0.5 week; Blaha 1 week; Dundorf 0.5 week; McElaney 0.5 week)
9. Advisory team input on Energy Planner.
10. Initial Graphics Design of Energy Planner. (1.5 weeks)

#### **October 2010 - Dec 2010**

1. Begin coding of Energy Planner. (Armstrong 8 weeks; Blaha 1 week)

#### **January 2011 - March 2011**

1. Finish coding of Energy Planner. (Armstrong 4 weeks; Blaha 1 week)
2. Beta testing of Energy Planner. (Blaha 1 week; Schloss 1 week; Dundorf 1 week; McElaney 1 week)
3. Final Graphics design of Energy Planner. (1 week)
4. Final advisory team input on Energy Planner.
5. Final testing and modifications to Energy Planner. (Armstrong 1 week; Blaha 1 week; Schloss 1 week; McElaney 1 week)

#### **April 2011 - June 2011**

1. Public release, advertising & marketing of Energy Planner. (Blaha 1 week; McElaney 1 week)
2. Public training webinars to Local Energy Committees (LECs) on Home Energy Planner.

#### **Community Outreach and Engagement Work Plan**

Unlike the technical work plan, our community engagement work plan cannot be partitioned into yearly quarters. The work is ongoing. The community coordinator will be our chief liaison to towns, schools, civic organizations, and faith-based communities. He or she will work directly with these communities, providing them with implementation strategies, best practices, regular progress updates, and answering any questions they may have. The community coordinator will also oversee our volunteer presenters and will produce online documents identifying lessons learned and best practices from our community challenges. New Hampshire has 234 cities and towns, 670 schools and more than 700 faith-based communities. To provide these communities with the resources and support they need to effectively reduce household emissions, the community coordinator should be a full-time position.

Julia Dundorf will continue her role as chief liaison to businesses through our fee-based Employee Carbon Challenge program. We anticipate the Employee Carbon Challenge program will be a significant revenue source to the Carbon Challenge. We have allocated 20 hours a week (26 weeks) of Julia's time for this purpose. Denise Blaha will continue as the NHCC webmaster (12 weeks) and develop new on-line resources and tools, provide oversight to the Community Coordinator (2 weeks) and expand our outreach by seeking new opportunities to work with communities (6 weeks). She will also fulfill the NH Carbon Challenge's report and compliance obligations (4 weeks).

#### **Project Oversight, Quality Assurance, and Financial Management**

Dr. David Bartlett, Associate Director of the UNH Institute for the Study of Earth, Oceans, and Space will be the Principal Investigator for the New Hampshire Carbon Challenge, and Dr. Annette Schloss from the UNH Institute for the Study of Earth, Oceans, and Space will serve as Co-PI. Drs. Bartlett and Schloss will provide project oversight. Co-directors Julia Dundorf and Denise Blaha will oversee the implementation of the workplan, day-to-day management of the program and compliance with all reporting requirements. Our thorough testing of all web-based tools through our advisory panel of stakeholders ensures all of our products will be of the highest quality. Financial management will be the responsibility of the UNH Office of Sponsored Research.

## **PROJECT BENEFITS**

Since our inception in October 2006, the New Hampshire Carbon Challenge has been providing New Hampshire households and communities with the tools, resources, and support essential to reducing greenhouse gas emissions and energy costs. With the release of our New England Carbon Estimator™ in October 2007, we've been able to quantify the impacts of the actions challenge takers have committed to take and their resulting carbon dioxide and energy dollars saved.

While the impacts of those households that have formally taken the Challenge can be quantified, this understates our true effectiveness since many more households and communities have used our tools and resources, but haven't formally taken the challenge. We have broad metrics on this second user community and applying a few simple assumptions, we can estimate the impact of the actions of these households. The enhancements to our New England Carbon Estimator we are proposing to make will significantly increase our ability to quantify the actions of these households, as we will use technologies not readily available when we created the initial Estimator to document these actions and effects.

The impacts of our new tools (the Incentives and Vendor Index, Home Energy Planner, and Green Homes Tourist) are difficult to quantify, since these tools have not been developed and thus we have no baseline usage statistics on which we can estimate their effects. Also, these tools are fundamentally different from our Carbon Estimator. While the Estimator directly links households to a set of actions that reduce greenhouse gas emissions and energy costs, our new tools only indirectly accomplish these goals, complicating an assessment of their impact. We can't know how many tours coordinated through Green Homes Tourist directly led to the purchases of solar hot water systems or geothermal heat pumps, nor can we accurately assess how many energy efficiency measures are undertaken as a result from our new Incentive and Vendor Index tool. We will survey a subset of households who use these tools to track these impacts, but this too is an imprecise measurement. What is clear, however, is that without a fundamental restructuring and improvement in the delivery of energy information that removes the many obstacles that residents encounter in reducing their energy consumption, a transformative shift in the use of energy that is necessary to achieve climate stabilization is simply impossible. Our proposed new tools are the essential building blocks to substantially reducing residential greenhouse gas emissions.

### **Tools and services developed by the New Hampshire Carbon Challenge under this proposal should achieve these results:**

#### **1. Reduce greenhouse gas emissions from all fuels used to provide electricity, heating and cooling in New Hampshire:**

New Hampshire households using our system have pledged to reduce their electricity emissions by 498.7 metric tons of CO<sub>2</sub> and their home heating emissions by 832.3 metric tons of CO<sub>2</sub> since October 2007. Based on the growth rate in challenge takers in the last six months and our projected expansion of community challenges throughout the state, we have set an objective of having at least 8000 households in New Hampshire take the challenge by June 2011. We assume that the actions taken by these households will be comparable to the actions of households that have already taken the challenge.

*Projected Impact:* 4560 metric tons of CO<sub>2</sub> reduced annually from electricity consumption and 7520 metric tons of CO<sub>2</sub> reduced annually from home heating fuels.<sup>1</sup>

## **2. Promote energy cost savings:**

New Hampshire households using the New Hampshire Carbon Challenge have identified energy saving actions that are reducing their energy costs from electricity consumption by \$150,630 and their home heating costs by \$266,804. Using the assumptions and methodology outlined above, the projected impact to June 2011 would be:

*Projected Impact:* \$1.37 million dollars saved annually in reduced electricity costs and \$2.42 million dollars saved annually in home heating costs.<sup>1</sup>

## **3. Reduce New Hampshire's peak electric load:**

We will add actions to the Carbon Estimator that reduce New Hampshire's summertime peak electric load. We already promote line drying as an alternative to gas or electric clothes dryers, and will add actions that encourage households to use ceiling or window fans rather than air conditioners, increase the temperature settings of their air conditioners, and publicize the importance of using off-peak hours for large consumers of electricity such as clothes dryers.

*Projected Impact:* Indeterminate, as most of these actions have not yet been included in the Carbon Estimator.

## **4. Promote market transformation:**

By increasing New Hampshire residents' understanding of energy issues and the actions they can take to reduce their energy consumption and energy costs, the New Hampshire Carbon Challenge is cultivating increased demand among residents for a broad range of energy efficiency products and sustainable energy technologies, from weather-stripping, Energy Star appliances, and smart power strips, to energy audits, photovoltaics, solar thermal systems, and other sustainable energy technologies. Enhancements we intend to make to the Carbon Estimator and our new tools should result in even greater demand for these products and technologies.

*Projected Impact:* Indeterminate, although resident surveys and increased collaboration between the NHCC and other energy service providers (NH Sustainable Energy Association, Cooperative Extension Energy Answers, Local Energy Committees, REPA, and utilities) toward collecting these impact metrics will improve our ability to estimate these effects.

## **5. Otherwise be consistent with the public interest and the purposes of RSA 125-O:19.**

The New Hampshire Carbon Challenge is wholly consistent with RCI Action 4.3 in the draft New Hampshire Climate Action Plan (NHCAP), "*Reducing Residential Energy Demand through Education and Outreach*" and is identified by name in that recommended action. In addition, our proposed "Incentive and Vendor Index" and "Home Energy Planner" fulfill the stated objectives in RCI Action 4.5 "*Create an Energy Efficiency and Sustainable Energy Systems Web Portal*" for a residential energy portal. Developing an integrated overarching education and outreach plan is a key objective articulated in the NHCAP (RCI Action 4.6) which identifies the New Hampshire Carbon Challenge as an effective educational program that should be supported. Early and innovative efforts such as the Carbon Challenge lay the groundwork for implementing a comprehensive outreach and education plan and complement the work force training identified as essential in the NHCAP.

<sup>1</sup> Greenhouse gas emission reductions and energy dollars saved estimates from electricity and home heating are based on the projected average savings of all NH households that have taken the Carbon Challenge (electricity: 0.57 metric tons CO<sub>2</sub> and \$171; home heating: 0.94 metric tons CO<sub>2</sub> and \$303) multiplied by 8000 households.

**MEASUREMENT AND VERIFICATION:**

Since the proposed web-based tools will reside on the NH Carbon Challenge website, impact metrics such as the number of users, carbon dioxide reduced, energy dollars saved and green home tours coordinated can be easily collected and reported. All proposed web tools can be made available to NH DES, NH Office of Energy and Planning, and NH PUC through their websites using an IFRAME HTML tag.

We anticipate our program activities during the proposed grant period will have these impacts, outcomes, and verification:

Activities	Evaluation	Projected Impacts and Outcomes	Verification
<p><b><i>On-Line Tool Development:</i></b></p> <ul style="list-style-type: none"> <li>• Enhanced NE Carbon Estimator</li> <li>• Incentive and Vendor Index</li> <li>• Green Homes Tourist</li> <li>• Home Energy Planner</li> </ul>	<ol style="list-style-type: none"> <li>1. Tools completed on-time</li> <li>2. Number of households taking the Challenge</li> <li>3. Energy reduction actions pledged and actions taken.</li> <li>4. Energy dollars saved</li> <li>5. Vendor contacts</li> <li>6. Home tours coordinated</li> <li>7. Number of energy audits</li> <li>8. Sales of efficiency products</li> <li>9. Utilization of CORE services</li> <li>10. Sales of renewable energy systems.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tools delivered on-time</li> <li>2. Increase number of households taking Challenge to 8,000</li> <li>3. CO2 reduced by 12,080 metric tons</li> <li>4. \$3.8 million saved in reduced energy costs</li> <li>5. Quarterly growth in vendor contacts</li> <li>6. Quarterly growth in home tours</li> <li>7. Increase in energy audits</li> <li>8. Increased sales of efficiency products</li> <li>9. Increased utilization of CORE services</li> <li>10. Increased sales of renewable energy systems.</li> </ol>	<ol style="list-style-type: none"> <li>1. Delivery dates met</li> <li>2. NHCC metrics reports</li> <li>3. NHCC metrics reports; survey</li> <li>4. NHCC metrics reports; survey</li> <li>5. Survey</li> <li>6. Green Homes Tourist metrics</li> <li>7 -10. Survey</li> </ol>
<p><b><i>Community Outreach:</i></b></p> <ul style="list-style-type: none"> <li>• Employee Carbon Challenge Program (fee-for-service)</li> <li>• Community Carbon Challenges (in schools, towns, churches, neighborhoods)</li> <li>• Create informational guides and resources.</li> <li>• Automate key systems to serve wider audience</li> </ul>	<ol style="list-style-type: none"> <li>1. # of participating companies</li> <li>2. # of Community Challenges launched</li> <li>3. On-line resources &amp; case studies generated.</li> <li>4. Number of systems and modules automated.</li> <li>5. See Evaluation items 2-10 above.</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase in number of participating companies. Increasing revenue stream to NH Carbon Challenge from ECC.</li> <li>2. Number of Community Challenges will increase to 100 by 2011.</li> <li>3. On-line implementation guides by community type will be developed; “how-to” videos produced and made available.</li> <li>4. All critical systems will be automated by 2010.</li> <li>5. See Projected Impacts items 2-10 above.</li> </ol>	<ol style="list-style-type: none"> <li>1. NHCC quarterly progress reports</li> <li>2. NHCC quarterly progress reports</li> <li>3. Website</li> <li>4. NHCC quarterly progress reports</li> <li>5. See Verification items 2-10 above.</li> </ol>

## **BUDGET NARRATIVE**

The request for funding includes salary support and fringe for Denise Blaha, Bill Armstrong, Annette Schloss and a community coordinator. The funding request also includes a consultancy agreement for support of Julia Dunderf's work. The budget provides \$10,000 for domestic travel and \$32,000 for materials, supplies, and communication costs over the two year period. Estimated travel, supply, and communication costs are detailed in Attachment C. The budget also includes \$14,400 for graphics design of the new web tools and \$10,000 for a survey in Year 2 of residents in who have used Carbon Challenge tools and resources to assess the impact of these tools on residents' actions.

Denise Blaha will oversee the development of the proposed web-based tools. Denise will give public presentations on behalf of the Carbon Challenge, serve as the NHCC webmaster and supervise the community coordinator. (43 weeks Year 1; 40 weeks Year 2)

Bill Armstrong will be the lead software engineer and develop the proposed web-based tools. Bill will also serve as the systems administrator and technical webmaster and automate key systems to enable the Carbon Challenge to serve a wider audience. (38 weeks Year 1; 26 weeks Year 2)

Julia Dunderf and Denise Blaha will continue to share responsibility for development of program structure, goals and implementation strategies, fundraising plan, corporate partnerships and individual donor relations.

Julia Dunderf will lead the Employee Carbon Challenge program and be the chief liaison to businesses. Julia will also give public presentations on behalf of the Carbon Challenge. (30 weeks Year 1; 29 weeks Year 2)

The community coordinator will lead outreach efforts to schools, libraries, community groups, and civic organizations and create on-line guides and resources. The coordinator will also manage the NHCC volunteers and provide additional training opportunities to the volunteers. The coordinator will give public presentations to communities on behalf of the Carbon Challenge. (52 weeks Year 1; 52 weeks Year 2)

Annette Schloss will provide project oversight and participate in planning, development and testing of tools and programs created by this project. (2 weeks Year 1; 4 weeks Year 2)

The budget includes a \$25,000 yearly subcontract to the New Hampshire Sustainable Energy Association (NHSEA). This funding will support NHSEA's Program and Outreach Coordinator Madeline McElaney who will compile the energy statistics data sets required for the proposed incentives software tool, conduct the survey of NHSEA Green Homes Tourist participants, promote and market GHT and the Incentives and Vendor Index tool, assist residents in using these tools, and be part of the NHCC-NHSEA development team. (16 weeks Year 1; 16 weeks Year 2)

UNH's Fringe is 43.8% of salaries and Facilities & Administrative rate is capped at 35%. Supplemental documentation on the F&A rate is provided in Attachment E.

The budget includes \$14,206 in Year 1 and \$14,703 in Year 2 in-kind contributions. \$10,522 of this Year 1 in-kind support reflects Dr. David Bartlett's salary and fringe in-kind contribution (2 weeks/yr); while \$3683 reflects reduced Facilities and Administrative charges. In Year 2, \$10,892 of the \$14,703 in-kind contribution is Dr. Bartlett's salary and fringe (2 weeks/yr) while \$3812 results from reduced Facilities and Administrative charges.

## **BUDGET NARRATIVE (cont.)**

The New Hampshire Carbon Challenge has two pending grant applications: to the Orchard Foundation (\$20,000 per year for two years) and the Roy A. Hunt Foundation (\$50,000 for one year). As both of these proposals are pending with decisions expected by early summer, neither is included in this budget allocation.

### **Minimum Budget:**

Our GHGER requested budget of \$421,835 in Year 1 and \$391,567 in Year 2 reflects the development of three new web-based tools: The Incentives and Vendor Index, Green Homes Tourist, and Home Energy Planner, as well as an enhancement of our New England Carbon Estimator<sup>TM</sup>. These development costs are non-recurrent expenses.

The minimum budget for the NH Carbon Challenge excludes these three new tools and forgoes the hiring of a full-time community coordinator. The minimum budget does include the enhanced New England Carbon Estimator<sup>TM</sup>, which we view as essential. We have received a number of requests for modifications to the Estimator from households that have taken the challenge in the last two years and we want to include many of these suggested changes in the enhanced Estimator. The minimum budget includes the personnel and labor costs for this development, as well as the minimum staffing required to conduct some community outreach. The subcontract to New Hampshire Sustainable Energy Association (NHSEA) is reduced to \$12,500 in each of the two years and graphics design expenses are reduced to \$6000, since fewer web tools will be developed.

**The minimum budget for the New Hampshire Carbon Challenge is \$285,100 in Year 1 and \$232,721 in Year 2.**

## APPLICANT QUALIFICATIONS

The New Hampshire Carbon Challenge was co-founded in August 2006 by Julia Dundorf and Denise Blaha, who now serve as co-directors. Julia and Denise's backgrounds encompass small business ownership, non-profit management, earth science research, grassroots organizing, and local political activism. Julia also serves as the LEC Field Organizer to the Carbon Coalition and coordinates the Local Energy Committee Working Group while Denise is the project coordinator for UNH Cooperative Extension's Energy Answers program. Julia and Denise serve on a number of advisory committees such as the Green Alliance (<http://www.greenalliance.biz>), Climate Counts (<http://www.climatecounts.org/advisors.php>), the Rockingham/Strafford Energy Alliance and New Hampshire Public Television's GoGreenNH. Resumes for key personnel are provided in Attachment D.

The NH Carbon Challenge has a distinguished steering committee of scientists, community leaders, educators, and public policy analysts representing such diverse groups as the UNH Institute for the Study of Earth, Oceans, and Space, UNH Office of Sustainability, NH Department of Environmental Services, Clean Air-Cool Planet, New Hampshire Council of Churches, New Hampshire Science Teachers Association, Cooperative Extension, Climate Counts, and New England Grassroots Environment Fund.

The New Hampshire Sustainable Energy Association is a subcontractor and full partner in the work plan outlined in this proposal. NHSEA is a recognized leader in the public education and advocacy of sustainable energy technologies in New England and has been instrumental in helping New Hampshire residents transition to sustainable energy resources. The work performed by NHSEA under this proposal will be overseen by NHSEA Board President, Clay Mitchell, Esq. PhD.

The Carbon Challenge is built on the computer architecture and knowledge base of UNH's data distribution system EOS-WEBSTER (<http://eos-webster.sr.unh.edu>), which has distributed over one million terrestrial and coastal ocean observing data and information products to users world-wide since 1999 and consistently receives high marks in customer satisfaction. Dr. Schloss is the project manager for EOS-WEBSTER, and teamed with Denise Blaha and Bill Armstrong to design and implement the system. The Carbon Challenge is powered by two high end Dell PowerEdge 2950 Linux systems using the PostgreSQL object-oriented database, spatially enabled with the PostGIS extension. Lead software engineer Bill Armstrong has over 12 years experience in software development and wrote all the software code for our flagship product, the New England Carbon Estimator™ as well as EOS-WEBSTER. Systems administration is provided by the Research Computing Center at the University of New Hampshire. UNH has various internet connections including gigabit and OC3 ATM service, and is also an Internet2 participant, assuring virtually uninterrupted access to our servers.

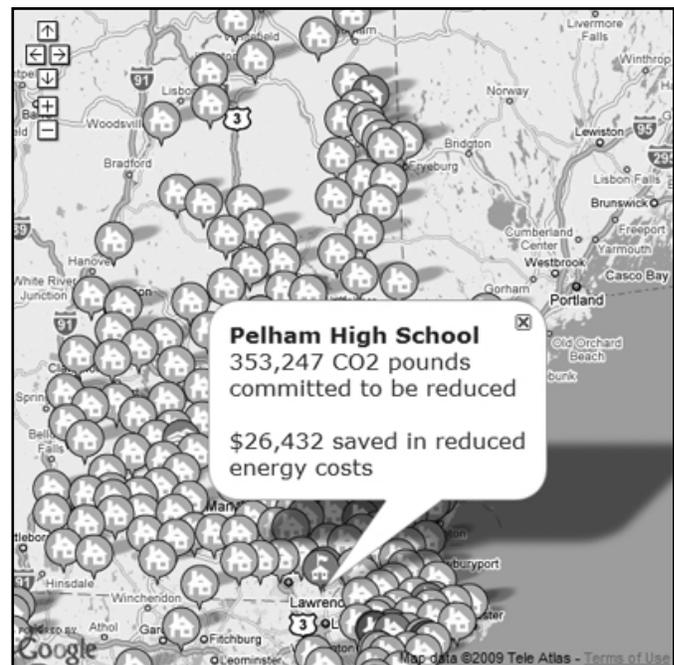
## ADDITIONAL INFORMATION

### Using Social Networks, Competition and Technology to Drive Change

Climate change is at root a “collective action” problem. While each individual and household can take steps to reduce their energy consumption, stabilizing greenhouse gas emissions requires that households, communities, and nations act together. This reality can steal an individual’s sense of empowerment when they ask, “What can I as an individual accomplish in a world of 6.8 billion people?”

This barrier to individual action may be addressed through community-based initiatives. As a part of a community, individual household actions can be linked to other households to show the collective impact of a neighborhood, school, civic organizations, town, or faith-based community taking steps to reduce its energy consumption. The New Hampshire Carbon Challenge is uniquely positioned to provide households and communities with the tools and resources needed to assess and then reduce residential energy consumption by linking these households together through our New England Carbon Estimator™. We also provide communities with regular updates on their progress and recognition for their achievements through our Google map of challenge takers, our electronic newsletter *Home Matters*, and a monthly profile of New Hampshire Climate Heroes.

Competition has proven to be a powerful tool in prompting household and community action. We encourage friendly competitions among towns by ranking the top ten towns that are taking the challenge in a table automatically updated on our homepage. The emergence of several Massachusetts towns on this rankings chart has been a powerful motivator to many NH towns. Most recently, a successful effort by students at Reading Memorial High School to make Reading, MA the Number #1 town in New England taking the Carbon Challenge was met by the equally determined students of Pelham High School in Pelham, NH. The city of Keene, NH has challenged the city of Portsmouth, NH to a two-staged carbon challenge, first municipal employees and then residents, beginning April 1, 2009. The municipal challenge will end on April 17 and culminate in an awards presentation to the “winning” mayor and a call to action for the community at large to join the Keene/Portsmouth Challenges.



Our Google Map of Challenge Takers:  
[carbonchallenge.sr.unh.edu/maps/challenge\\_takers.jsp](http://carbonchallenge.sr.unh.edu/maps/challenge_takers.jsp)

## LIST OF ATTACHMENTS

- A: Letters of Commitment and Support
- B: Budget Worksheets (Requested & Minimum Budgets) & Personnel Details
- C: Travel, Supply, and Communications Budget Details
- D. Resumes or Curriculum Vitaes of Key Personnel
- E: Supplemental Documentation on Facilities and Administrative Cost Rates



**Jack Ruderman**

March 18, 2009

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

Dear Jack,

It is my pleasure to write a letter of support for the NH Carbon Challenge (NHCC) GHGER grant proposal. We strongly support their efforts to provide residents and communities with the information, tools and support they need to reduce energy consumption and greenhouse gas emissions.

As you know, the New Hampshire Sustainable Energy Association was established in 2003 to educate NH citizens and organizations about sustainable energy and advocate for favorable sustainable energy policies in NH.

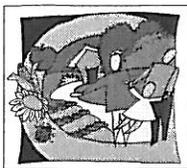
As Board President, I am writing to endorse the work plan outlined in the GHGER grant proposal and to indicate that NHSEA will be 100% on board as a partner to help carry out the design and implementation of the Green Homes Tourist web system, the Incentives and Vendors index, and be part of the NHCC-NHSEA development team. These tasks and results are consistent with our 2009 Strategic Plan and build upon our past efforts.

NHSEA is very excited and committed to partner with NHCC on their efforts to promote energy efficiency and conservation and to reduce New Hampshire's peak energy load. We have practiced the belief that collaborative efforts like this will empower households and communities in New Hampshire to act together to reduce energy consumption and thus reduce CO2 emissions in a cost effective manner.

Sincerely,

A handwritten signature in black ink, appearing to read "Clay Mitchell". The signature is written in a cursive style and is enclosed within a large, horizontal, oval-shaped flourish.

Clay Mitchell, Esq. PhD  
Board President, New Hampshire Sustainable Energy Association



ATTACHMENT A

March 16, 2009

**FAMILY, HOME &  
GARDEN  
EDUCATION CENTER**  
200 Bedford Street  
Manchester, NH 03101  
1-877-EXT-GROW  
(1-877-398-4769)  
Fax: 603-629-9998

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

*County Offices*

**Belknap County**  
527-5475

**Carroll County**  
447-3834

**Cheshire County**  
352-4550

**Coos County**  
788-4961

**Grafton County**  
787-6944

**Hillsborough County**  
Goffstown: 641-6060  
FHGEC-629-9494

**Merrimack County**  
796-2151

**Rockingham County**  
679-5616

**Strafford County**  
749-4445

**Sullivan County**  
863-9200

Dear Jack,

It is our honor to write a letter of support for the NH Carbon Challenge GHGER grant proposal. We strongly support their efforts to reduce greenhouse gas emissions. For the past six months, we have worked with NH Carbon Challenge and look forward to cooperating with them on their future projects.

UNH Cooperative Extension started the Energy Answers Project to answer NH residents' calls about energy efficiency. Using trained volunteers at the Family, Home and Garden Education Center, the Energy Answers volunteers will use existing NHCC tools as well as the tools developed through the NHCC GHGER proposal to assist callers with their energy efficiency questions. We also plan for the volunteers to help with beta testing the tools for NHCC. The Energy Answers volunteers are also positioned to become more experienced Energy Navigators who can help with the Green Homes Tourist project. The volunteers will also be recruited to participate in other outreach activities in coordination with the NHCC. We feel that NHCC is a complementary project to Energy Answers and their expansion will enhance our outreach efforts. As a result, NH residents will become better informed of their energy savings alternatives.

In addition, the Energy Answers project will be collaborating with other energy information providers to support a network of energy efficiency and sustainability information. These coordinated efforts will bring the most effective and efficient use of public and private resources and make the greatest impact on NH's energy consumption.

In working with Denise Blaha, she has shown tremendous enthusiasm and passion for reducing greenhouse gas emissions. Her skills are well suited to lead the expansion of the NHCC.

Sincerely,

Alice A. Mullen  
Administrator, UNHCE Family,  
Home and Garden Education Center

Tim Fleury  
Extension Educator,  
Forest Resources



February 24, 2009

To Whom It May Concern:

It is with great pleasure that I submit this letter of recommendation for NH Carbon Challenge on behalf of the Timberland Company. As Timberland takes a deep dive into environmental stewardship, it has been wonderful to connect with NH Carbon Challenge as an invaluable community resource.

THE TIMBERLAND COMPANY

200 DOMAIN DRIVE

STRATHAM

NEW HAMPSHIRE

03885

603.772.9500

Timberland engaged NHCC in 2007 and 2008 to provide trainings and presentations to the employees at our Stratham, NH headquarters on the science of climate change and concrete ways to mitigate it. We recently renewed our financial support of NHCC due to its successful application to expand the impact of its program. Originally, Timberland used the Employee Carbon Challenge Program as an introduction for employees to engage in a dialogue concerning their ability to have an impact on climate change. As Timberland's relationship with NHCC deepened, Timberland has successfully leveraged the program as a means to engage our employees in education and action steps to mitigate climate change at work. According to employees, the Carbon Challenge program's strength is its concise, specific content about behavior changes followed by a concrete pledge through which employees commit to make these changes in their lives.

I have been equally impressed with the overall management of NHCC. At each step in our partnership, Julia Dunderf and Denise Blaha have demonstrated a depth of scientific knowledge as well as the ability to flex and adapt the Carbon Challenge to meet Timberland's particular needs. NHCC has also shown the foresight to leverage each corporate relationship as an opportunity to hone a model that will enable them to reach even more employee populations with powerful behavior change messages. While climate change is science, there is an art to the ability to engage people in collectively making a difference. Julia and Denise's ability to merge the art with the science makes this a top-rate program that I am delighted to recommend.

Sincerely,

Nancy Morrison  
Community Affairs

# Hampstead Public Library

9 Mary E. Clark Dr. Hampstead, NH 03841

VOICE: (603) 329-6411 FAX: (603) 329-6036

[www.hampstead.lib.nh.us](http://www.hampstead.lib.nh.us)

February 10, 2009

To whom it may concern:

The Carbon Challenge was an invigorating event for the Hampstead Public Library. It promoted town spirit and community involvement as well as energy conservation. We received great support from Denise Blaha, which helped everything run smoothly.

The Hampstead Public Library produced a month-long Carbon Challenge event which included the presentation by Denise Blaha and Debra Connamon-Whelan, and four other energy related programs. In addition, we provided recycling opportunities for a selection of items. The local media was quite interested in this initiative and gave the library extensive press which helped to publicize both the library and energy conservation in general.

The topic was general enough so that we could provide something for everybody. Our programming varied from local recycling practices to information about LEED-compliant new construction. We caught the attention of one segment of the population by stressing the environmental issues, and another segment by pointing out the financial benefits of going green. We encouraged active involvement by striving, and succeeding, in becoming the number one town in New England taking the New Hampshire Carbon Challenge. In this way we were able to focus different kinds of people on the same topic, which brought disparate people together.

The support we received from Denise was wonderful. Her introductory talk for my staff provided practical information about the survey and website as well as motivational information that got us fired up. She was very responsive, providing any information that we needed and answering any questions that we had. The public Carbon Challenge presentation was well received and was simple, clear and relevant. She was supportive, encouraging and very enthusiastic.

Personally, I had never been particularly aware of energy issues. The Carbon Challenge taught me so much and has inspired me to make changes in my life that are better for me and better for the planet. I did not anticipate the impact on my own life when we decided to do this event.

There were significant benefits to the library, as well. The Carbon Challenge provided "buzz" in the town which publicized the library and the services that we offer. It helped focus my staff in a single direction, contributing to staff cohesion. The benefits of the Carbon Challenge event were so great that I have decided to schedule a month long event twice a year. In April we will be immersed in the 1920s during our town-wide Big Read of *The Great Gatsby*.

The Hampstead Carbon Challenge was good for the environment, good for the Town of Hampstead, and good for the Hampstead Public Library. I encourage other libraries to sponsor a Challenge of their own.

Sincerely,



Peggy Thrasher

Director, Hampstead Public Library

Requested

NH PUC Greenhouse Gas Emissions Reduction Fund		2/23/09 RFP Proposed Budget Worksheet						REQUESTED AMOUNTS FOR TARGETED PROGRAM SIZE					
Program Title:		Reducing Residential Energy Consumption Through the New Hampshire Carbon Challenge											
Applicant Name:		University of New Hampshire											
USE OF FUNDS	2009							2010					2011
	April	May	June	Q2	Q3	Q4	Total CY09	Q1	Q2	Q3	Q4	Total CY10	Total CY11
<b>EXPENSES</b>													
Salaries & Wages				\$0	\$74,434	\$74,434	\$148,867	\$33,389	\$33,389	\$33,389	\$33,389	\$133,554	
Benefits/Fringe				\$0	\$32,602	\$32,602	\$65,203	\$14,624	\$14,624	\$14,624	\$14,624	\$58,496	
Contracted Labor & Services				\$0	\$36,700	\$36,700	\$73,400	\$20,250	\$20,250	\$20,250	\$20,250	\$81,000	
Rent & Utilities				\$0			\$0					\$0	
Advertising & Marketing				\$0			\$0					\$0	
Travel & Mileage Reimbursement				\$0	\$2,500	\$2,500	\$5,000	\$1,250	\$1,250	\$1,250	\$1,250	\$5,000	
Tools, Supplies, Subscriptions				\$0	\$10,000	\$10,000	\$20,000	\$3,000	\$3,000	\$3,000	\$3,000	\$12,000	
Other Current Expenses (such as office expense, insurance, maintenance, repairs, taxes, legal, etc.)				\$0			\$0					\$0	
Cost of Goods Installed				\$0			\$0					\$0	
General Overhead & Profit*				\$0	\$54,683	\$54,683	\$109,365	\$25,379	\$25,379	\$25,379	\$25,379	\$101,517	
<b>TOTAL EXPENSES</b>	\$0	\$0	\$0	\$0	\$210,918	\$210,918	\$421,835	\$97,892	\$97,892	\$97,892	\$97,892	\$391,567	\$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	\$0	\$0	\$0	\$210,918	\$210,918	\$421,835	\$97,892	\$97,892	\$97,892	\$97,892	\$391,567	\$0
SOURCES OF FUNDS	2009							2010					2011
	April	May	June	Q2	Q3	Q4	Total CY09	Q1	Q2	Q3	Q4	Total CY10	Total CY11
Applicant Cash Contribution				\$0			\$0					\$0	
Applicant In-kind Contribution				\$0	\$7,103	\$7,103	\$14,206	\$3,676	\$3,676	\$3,676	\$3,676	\$14,703	
Program Participant Contribution				\$0			\$0					\$0	
Loans & Other Financing				\$0			\$0					\$0	
Forward Capacity Market Payments				\$0			\$0					\$0	
Other Grants				\$0			\$0					\$0	
<b>GHGER Fund (this proposal)</b>				\$0			\$0					\$0	
<b>TOTAL SOURCES OF FUNDS</b>	\$0	\$0	\$0	\$0	\$7,103	\$7,103	\$14,206	\$3,676	\$3,676	\$3,676	\$3,676	\$14,703	\$0
GHGER Funds as a % of TOTAL							0%					0%	#DIV/0!

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

ATTACHMENT B: Budget Worksheets: Minimum Feasible Program Size

Minimum

NH PUC Greenhouse Gas Emissions Reduction Fund		2/23/09 RFP Proposed Budget Worksheet						MINIMUM FEASIBLE PROGRAM SIZE					
Program Title:		educing Residential Energy Consumption Through the New Hampshire Carbon Challenge											
Applicant Name:		University of New Hampshire											
	2009							2010					2011
USE OF FUNDS	April	May	June	Q2	Q3	Q4	Total CY09	Q1	Q2	Q3	Q4	Total CY10	Total CY11
<b>EXPENSES</b>													
Salaries & Wages				\$0	\$47,179	\$47,179	\$94,357	\$17,887	\$17,887	\$17,887	\$17,887	\$71,548	
Benefits/Fringe				\$0	\$20,664	\$20,664	\$41,328	\$7,835	\$7,835	\$7,835	\$7,835	\$31,338	
Contracted Labor & Services				\$0	\$29,250	\$29,250	\$58,500	\$13,125	\$13,125	\$13,125	\$13,125	\$52,500	
Rent & Utilities				\$0			\$0					\$0	
Advertising & Marketing				\$0			\$0					\$0	
Travel & Mileage Reimbursement				\$0	\$2,500	\$2,500	\$5,000	\$1,250	\$1,250	\$1,250	\$1,250	\$5,000	
Tools, Supplies, Subscriptions				\$0	\$6,000	\$6,000	\$12,000	\$3,000	\$3,000	\$3,000	\$3,000	\$12,000	
Other Current Expenses (such as office expense, insurance, maintenance, repairs, taxes, legal, etc.)				\$0			\$0					\$0	
Cost of Goods Installed				\$0			\$0					\$0	
General Overhead & Profit*				\$0	\$36,958	\$36,958	\$73,915	\$15,084	\$15,084	\$15,084	\$15,084	\$60,335	
<b>TOTAL EXPENSES</b>	\$0	\$0	\$0	\$0	\$142,550	\$142,550	\$285,100	\$58,180	\$58,180	\$58,180	\$58,180	\$232,721	\$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	\$0	\$0	\$0	\$142,550	\$142,550	\$285,100	\$58,180	\$58,180	\$58,180	\$58,180	\$232,721	\$0
	2009							2010					2011
<b>SOURCES OF FUNDS</b>	April	May	June	Q2	Q3	Q4	Total CY09	Q1	Q2	Q3	Q4	Total CY10	Total CY11
Applicant Cash Contribution				\$0			\$0					\$0	
Applicant In-kind Contribution				\$0	\$7,103	\$7,103	\$14,206	\$3,676	\$3,676	\$3,676	\$3,676	\$14,703	
Program Participant Contribution				\$0			\$0					\$0	
Loans & Other Financing				\$0			\$0					\$0	
Forward Capacity Market Payments				\$0			\$0					\$0	
Other Grants				\$0			\$0					\$0	
<b>GHGER Fund (this proposal)</b>				\$0			\$0					\$0	
<b>TOTAL SOURCES OF FUNDS</b>	\$0	\$0	\$0	\$0	\$7,103	\$7,103	\$14,206	\$3,676	\$3,676	\$3,676	\$3,676	\$14,703	\$0
GHGER Funds as a % of TOTAL							0%					0%	#DIV/0!

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

ATTACHMENT B: PERSONNEL DETAILS

<b>Personnel Details</b>				
<b>Name</b>	<b>Position/Title</b>	<b>Salary</b>	<b>Year 1</b>	<b>Year 2</b>
Denise Blaha	Research Associate & NHCC Co-Director	\$50,839 *	43 weeks	40 weeks
Julia Dundorf	Consultant & NHCC Co-Director	\$40,000	30 weeks	29 weeks
Annette Schloss	Research Scientist III	\$75,640 *	2 weeks	4 weeks
Bill Armstrong	Information Technologist IV	\$87,794 *	38 weeks	26 weeks
	Community Coordinator	\$38,000 *	52 weeks	52 weeks
Madeline McElaney	NHSEA Program & Outreach Coordinator	\$25,000	16 weeks	16 weeks
* Subject to a 3.5% inflation increase in Year 2				

<b>ATTACHMENT C:</b>			
<b>TRAVEL, SUPPLY, COMMUNICATION BUDGET DETAILS</b>			
TRAVEL		YEAR 1	YEAR 2
Attend Behavior, Energy, Climate Change Conference in Washington DC (Nov 15-18 2009)		\$1,150	\$1,150
7000 miles driven per year (@ .55/mile) (mileage estimates based on 2008 actuals)		\$3,850	\$3,850
<b>TRAVEL BUDGET</b>		<b>\$5,000</b>	<b>\$5,000</b>
<b>SUPPLIES</b>			
2 professional videos encouraging residents to take the NH Carbon Challenge (\$3000 each video)		\$6,000	
3 Laptop Computers (\$1200 each)		\$3,600	
<b>SOFTWARE:</b>			
Adobe Acrobat (3 licenses)		\$500	
Camtasia Studio Software		\$300	
Go To Meeting Web Software (annual subscription)		\$468	\$468
Contant Contact Web Software (annual subscription)		\$900	\$900
Adobe Dreamweaver CS4			\$200
<b>MATERIALS AND PRINTING</b>			
printing costs, misc. supplies, promotional materials		\$5,500	\$7,500
<b>COMMUNICATIONS</b>			
Monthly Phone Charges (\$60 per month)		\$720	\$720
Mailing Costs (includes mailing 4000 bumper stickers or window decals to households that take the challenge)		\$2,000	\$2,000
<b>TOTAL SUPPLY &amp; COMMUNICATIONS BUDGET</b>		<b>19988</b>	<b>11788</b>

DAVID SCOTT BARTLETT

ADDRESS Institute for the Study of Earth, Oceans, and Space  
Morse Hall  
University of New Hampshire  
Durham, NH 03824  
(603) 862-0322 email: [david.bartlett@unh.edu](mailto:david.bartlett@unh.edu)

EDUCATION

Univ. of Delaware, Newark, DE - Ph.D., Marine Studies, 1979  
Univ. of Delaware, Newark, DE - M.S., Marine Studies, 1976  
Amherst College, Amherst, MA - B.A., Geology, 1971

EXPERIENCE

2001-Present Research Professor, Institute for the Study of Earth, Oceans, and Space  
University of New Hampshire

1991-Present Director, New Hampshire Space Grant Consortium

1989-Present Associate Director, Inst. for the Study of Earth, Oceans, and Space  
University of New Hampshire

1981-1989 Research Scientist, Atmospheric Sciences Division  
NASA Langley Research Center

1979-1981 National Research Council Postdoctoral Associate  
Marine Applications and Technology Division  
NASA Langley Research Center

AFFILIATIONS

Member: AAAS  
American Geophysical Union  
Sigma Xi  
UNH Marine Program Board  
New Hampshire Sea Grant Program, Policy Advisory Committee

RESEARCH INTERESTS

- Chemical interactions of the biosphere with the atmosphere
- Causes and effects of global-scale climate change
- Remote sensing of terrestrial and coastal environments

**Biographical Sketch****Annette L. Schloss**

Complex Systems Research Center

University of New Hampshire

Durham, NH 03820

Tel.: (603)862-0348/annette.schloss@unh.edu

**a) Professional Preparation**

University of Southern Maine	Biology and Chemistry	Bachelor of Arts, 1986
University of New Hampshire	Freshwater Ecology	Master of Science, 1990
University of New Hampshire	Freshwater Ecology	PhD in Zoology, 1997

**b) Professional Appointments**

2003 – present	Affiliate Faculty, Natural Resources Dept., UNH
1988 – present	Project Manager/Research Scientist, UNH

**c) Publications****c.i. Relevant Publications - websites:**

[Ice Planet Earth](#) – resources for learning about the polar regions for the IPY

[Measuring Vegetation Health](#) – resources for educators studying plants as “green canaries” from their backyard to analyzing satellite images.

[Earth Exploration Toolkit](#) – step-by-step instructions for educators to use data:

[Exploring Regional Differences in Climate Change](#)

[When is Dinner Served? Predicting the Spring Phytoplankton Bloom in the Gulf of Maine](#)

**c.ii. Other and Contributed Papers**

Schloss, A, C Sumners and P Reiff, Ice Worlds Takes Planetarium Audiences to our Polar Regions and Beyond, American Geophysical Union Meeting, San Francisco, CA, USA, December, 2008.

Schloss, A, W Armstrong, D Blaha and A Cline, Using Icebox To View And Explore Satellite Images Of The Gulf Of Maine, IEEE International Geoscience and Remote Sensing Symposium, Boston, MA, July 2008.

Sumners, C, A Schloss and P Reiff, NEW Planetarium Shows for Polar Informal Science Education, American Geophysical Union Meeting, San Francisco, CA, USA, Dec., 2007.

Schloss, A, The Phenology of Stream Insects, Coordinating a Northeast Phenology Network Workshop, NE Phenology Network Working Group, Durham, NH November 2007.

Schloss, A, Hands-on Activities with Free Image Analysis Software, What’s in a Pixel?, An Introduction to Remote Sensing Technology, Data and Applications in New Hampshire Workshop, UNH Cooperative Extension, Durham, NH, September 2007.

Schloss, AL, DW Kicklighter, U Wittenberg, J Kaduk, and the participants of “Potsdam ‘95” (1998) Comparing global models of terrestrial net primary productivity (NPP): Comparison of annual net primary productivity and climatic drivers, *Global Change Biology*, 5:25-34.

McGuire A.D., S. Sitch, R. Dargaville, G. Esser, J. Foley, M. Heimann, F. Joos, J. Kaplan, D. W. Kicklighter, R. A. Meier, J. M. Melillo, B. Moore III, I. C. Prentice, N. Ramankutty, T. Reichenau, A. Schloss, H. Tian, U. Wittenberg (2001). The effects of CO<sub>2</sub>, climate and land-use on terrestrial carbon balance, 1920-1992: An analysis with four process-based ecosystem models, *Global Biogeochemical Cycles*, 15: 183-206.

Vorosmarty, C.J., C.A. Federer and A. Schloss. (1998) Potential evaporation functions compared on U.S. watersheds: Implications for global-scale water balance and terrestrial ecosystem modeling. *J. of Hydrology*, 207: 147-169.

Melillo, J. M., A. D. McGuire, D. W. Kicklighter, B. Moore III, C. J. Vorosmarty and A. L. Schloss (1993). Global climate change and terrestrial net primary production, *Nature*, 363: 234-240.

#### **d) Synergistic Activities**

My work extends the use of global change data sets housed in the EOS-WEBSTER digital library (eos-webster.sr.unh.edu) to the public through web-based resources and community-based initiatives and to educators through collaborative projects. The latest project produced the NSF-sponsored 20-min full dome planetarium show, *Ice Worlds*, that discusses the balance of ice and water in relation to Earth's climate and tours icy planets in the solar system.

My collaborations with educators have produced the Earth Exploration Toolbook (EET), a reviewed collection in the Digital Library for Earth System Education (DLESE). Chapters contributed to the EET are "*Exploring Regional Differences in Climate Change*" and "*When is Dinner Served? Predicting the Spring Phytoplankton Bloom in the Gulf of Maine.*" The climate change chapter is in use at high schools and colleges across the nation. The phytoplankton chapter was chosen by educators as a Top Web Pick and a "must for anyone teaching marine science" and was featured in the NetWatch section of the journal *Science* (2005, 310:1401). The "*Measuring Vegetation Health*" project, is a collaborative NASA-funded project led by the Museum of Science, Boston. The project teaches K-12 students about plant greenness using a variety of devices, from simple "stress-detection" glasses to analyzing satellite imagery (housed in EOS-WEBSTER). The MVH project has led to "PicturePost", a new grant funded by NASA that will engage formal and informal science programs in using digital photography to monitor their world. I am participating in *Exploring Ecosystems and the Atmosphere in the K-12 Classroom: A Plan to Integrate NASA Carbon Cycle Science with GLOBE*, that connects carbon cycle research with the classroom. My most recent collaboration is the production of *Ice Worlds*, a 20-min full-dome planetarium show for NSF informal science education regarding ice and water on Earth and other planets that includes data from UNH research projects.

I teach courses and seminars at the University (Issues in Remote Sensing of Freshwater; Ecology of Polluted Waters) and give guest lectures in several courses in remote sensing and science information systems such as utilizing the EOS-WEBSTER digital library for science and educational activities.

I have been active in the Federation of Earth Science Information Partners since 1998, serving as Committee Chair and Co-Chair for the Standing Committees for Community Engagement and Products and Services and as member of the Board of Directors of the Foundation for Earth Science Information Partners. As a member of this organization, I have participated in activities to expand the user base of Earth science data by representing the Federation at several national science and educational meetings (such as AGU, NSTA, ASPRS, ASLO), and giving lectures to other organizations that seek to accomplish similar goals through open-source technology and standards (NOAA-COTS, GO-ESSP, OOS-Tech).

#### **e. Collaborators & Other Affiliations**

**Collaborators and Co-Editors:** J. Beaudry (USM); R. Braswell (UNH); J. Campbell (UNH); M. Fahnestock (UNH); A. Gould (LHS); J. Haney; G. Hurtt (UNH); T. Ledley (TERC); P. Mausel (ISU); B. Moore (UNH); B. Rock (UNH); C. Vorosmarty (UNH). **Graduate Advisors:** James F. Haney, UNH (MS and PhD). **Graduate Student Committees:** PhD: D. Figueroa-Nieves, R. Konisky. MS: J. Baldizar, S. Carlson

**Julia Betjemann Dundorf**  
 35 McDaniel Shore Drive  
 Barrington, NH 03825  
 (603) 978-2482  
[juliadundorf@metrocast.net](mailto:juliadundorf@metrocast.net)

## **PROFESSIONAL EXPERIENCE**

- 2006 - present      **CO-DIRECTOR, NEW HAMPSHIRE CARBON CHALLENGE, UNIVERSITY OF NH, DURHAM, NH**  
 Co-founded a grassroots initiative committed to providing NH residents and communities with the information, tools and support necessary for NH households to reduce their residential carbon dioxide emissions by 10,000 pounds per year. A key objective of the NH Carbon Challenge is to develop a duplicable residential outreach model using research-based voluntary behavioral change tools that target the root causes of climate change inaction and utilize the networks and community organizations that can foster personal behavioral change.
- As one of two program directors share responsibility for:
- Development of program structure, goals and implementation strategies.
  - Fundraising plan, including grant writing, corporate partnerships and individual donor relations
  - Public presentations and corporate trainings
  - Interfacing with steering committee members
  - Volunteer coordination
  - Training workshop design and implementation
  - Communications and marketing
  - Developing collaborations with other nonprofits and agencies
- 2008- present      **LOCAL ENERGY COMMITTEE FIELD ORGANIZER, CARBON COALITION, PORTSMOUTH, NH**  
 Assist communities across NH to establish, grow and maintain local energy committees (LECs) to address local energy related issues with targeted, proven solutions.
- Coordinate the LEC Working Group, a cross-sector collaborative of nonprofits, state and federal agencies, and companies working toward local energy solutions.
  - Assist in communications to statewide LEC contacts
  - Coordinate workshops to promote and facilitate regional collaboration among institutional partners and to meet the needs of LECs
  - Implemented a needs assessment of existing and developing NH LECs
  - Organized a coordinated effort to link LEC members and their constituents with the NH Climate Change Policy Task Force and LEC relevant state legislation.
- Present
- FOUNDING MEMBER & STEERING COMMITTEE, BARRINGTON (NH) ENERGY TASK FORCE**
- CO-FOUNDER, ROCKINGHAM/STRAFFORD ENERGY COMMITTEE ALLIANCE**
- MEMBER, CARBON COALITION STEERING COMMITTEE AND LOCAL ENERGY COMMITTEE WORKING GROUP**
- UNIVERSITY OF NEW HAMPSHIRE SPEAKERS BUREAU**
- ADVISORY BOARD, CLIMATE COUNTS**
- ADVISORY BOARD, GREEN ALLIANCE, PORTSMOUTH, NH**
- PARTNER ADVISORY GROUP, PLANET GRANITE, NH PUBLIC TELEVISION,**  
 A NHPTV Community Engagement Initiative for Sustainability
- 2003 – 2005      **OWNER, MENDUMS PROPERTIES, LLC, BARRINGTON, NH**  
 Co- founder and owner of a company that provided residential rental units.  
 Responsible for all contractor negotiations and oversight, clerical, bookkeeping and fiscal tasks pertaining to running of the business.

- 1996 - 2001      **EXECUTIVE DIRECTOR/PRESIDENT, YANKEE BARNRAISING, INC., BARRINGTON, NH**  
 Jointly founded and directed a grass-roots nonprofit dedicated to helping low-income and disabled individuals in southeast New Hampshire in need of home repairs or alterations. These services, provided free-of-charge, included accessibility alterations, wheelchair ramps, and roof repairs.
- Supervised numerous committees, board members and volunteers
  - Wrote several successful grant applications, which supported the all-volunteer organization
  - Conducted public presentations and corporate meetings
  - Day-to-day management of organization
- 1994 - 1997      **OWNER, ECLECTIX-TIMELESS DESIGNS, INC., PORTSMOUTH, NH**  
 Owned and operated home furnishings company with both retail and wholesale operations.
- Designed, constructed and marketed unique line of furniture and home furnishings with an emphasis on reclaimed and reused materials
  - Responsible for all bookkeeping, inventory and clerical needs
- 1993 - 1994      **DEVELOPMENT PROGRAM MANAGER, ENVIRONMENTAL HAZARDS MANAGEMENT INSTITUTE (EHMI), DURHAM, NH**
- Responsible for developing, implementing and overseeing a financial development program for an internationally focused nonprofit environmental organization
  - Member of the Personnel Policy Committee, the company's core tactical group, and the new product development committee
- 1992 - 1993      **REGIONAL MANAGER, EHMI, DURHAM, NH**  
 One of two regional managers who oversaw two international sales territories.
- Provided training, mentoring and supervision of sales representatives
  - Designed and implemented strategic sales and marketing plans, including Fortune 500 clients
  - Maintained a client database, a revenue and receivables tracking system, new leads generation

**COMMUNITY SERVICE EXPERIENCE**

- 1999 - 2000      **BOARD MEMBER, A SAFE PLACE, PORTSMOUTH, NH**  
 Involved in an advisory and oversight capacity for the Seacoast Task Force on Family Violence, Inc. (A Safe Place).
- General board member responsibilities, including fiscal oversight of organization
  - Assisted with setting of long-range goals and creating organizational policy
  - Designed & implemented special events and fundraisers
- 1996 - 1999      **VOLUNTEER, A SAFE PLACE, PORTSMOUTH, NH**  
 Worked as a volunteer for a nonprofit that provides various support services for battered women and their children.
- Staffed a confidential abuse hotline
  - Kept records of client interaction
  - Performed maintenance on the confidential shelter
  - Performed direct services for shelter residents
- 1996-1998      Big Brother Big Sister

**EDUCATION**

1986-1990      University of New Hampshire, Durham, New Hampshire  
 B.A. (Cum Laude), Dual Major: German and International Perspectives with concentration in Business Administration

**RELEVANT NOTES**

Was raised on a self-sufficient, off-grid family farm in Northern NH. Gained a deep appreciation for issues of sustainability, resource conservation and alternative energy. In 1997 built own energy efficient home which now includes thermal solar heating system for domestic and radiant heat use.

## Denise M. Blaha

### **Professional Experience:**

October 2006 – present

**Co-Founder and Co-Director**, *New Hampshire Carbon Challenge, University of New Hampshire* (<http://carbonchallenge.sr.unh.edu>). Co-founded and now co-direct a grassroots initiative committed to providing NH residents and communities with the information, tools and support necessary for NH households to reduce their residential carbon dioxide emissions by 10,000 pounds per year. The New Hampshire Carbon Challenge works to educate, inspire and support sustained reductions in household energy consumption by coupling innovative web-based tools with effective outreach strategies to households, businesses, schools, civic organizations, and faith-based communities. As one of two program directors share responsibility for:

- Development of program structure, goals and implementation strategies.
- Fundraising plan, including grant writing, corporate partnerships and individual donor relations
- Public presentations and corporate trainings
- Interfacing with steering committee members
- Volunteer coordination
- Training workshop design and implementation
- Communications and marketing
- Developing collaborations with other nonprofits and agencies

September 2008 – present

**Program Coordinator**, *University of New Hampshire Cooperative Extension Energy Answers*. Part-time coordinator of a new program to train Cooperative Extension volunteers to answer telephone questions from the public on a range of energy issues. Coordinated three needs assessment focus groups with stakeholders to guide the curriculum development and training of the volunteers. Work collaboratively as part of an 11 member Energy Answers team to implement program objectives and identify opportunities to integrate Energy Answers into existing and proposed energy initiatives in New Hampshire.

December 1998 – present

**Research Associate**, *EOS-WEBSTER and WebCOAST, University of New Hampshire*. As part of a team, developed, tested, and implemented a web-based system to distribute terrestrial and coastal ocean observing data to users worldwide. Over one million data and information products have been distributed since April 1999. Developed standards-based educational tools for middle school and high school students.

Oct 1997 – Dec. 1998

**Research Associate**, *NASA Large Scale Biosphere Atmosphere in Amazonia Ecology Project (LBA), University of New Hampshire*. Provided support in the administration of the Office of the Project Scientist, NASA LBA-Ecology.

July 1990 – Oct. 1997

**Research Associate**, *Global Atmospheric Chemistry Group, University of New Hampshire*. Compiled global and regional environmental, energy, and agricultural data sets in support of various projects estimating anthropogenic emissions of methane and nitrous oxide. Part of a research team investigating regional and U.S. methane emissions. Principal author of

publication detailing county-based estimates of anthropogenic methane emissions in New England.

### **Selected Publications:**

Skoglund, C., D. Blaha, and J. Dondorf (2008). The New Hampshire Carbon Challenge, in: Aber, J., Tom Kelly, and Bruce Mallory, eds. The Sustainable Learning Community: One University's Journey to the Future. University Press of New England (in press).

Blaha, D and A. Holt Cline (2005). When Is Dinner Served? Predicting the Spring Phytoplankton Bloom in the Gulf of Maine, in: Earth Exploration Toolbook (<http://serc.carleton.edu/eet/phytoplankton/>)

Blaha, D and R. Freuder. (2004). Exploring Regional Difference in Climate Change, in: Earth Exploration Toolbook (<http://serc.carleton.edu/eet/climate/>)

Blaha, D., K. Bartlett, P. Czepiel, R. Harriss, and P. Crill (1999). Natural and Anthropogenic Methane Sources in New England. *Atmospheric Environment* 33:243 - 255.

Blaha, D., B. Mosher, R.C. Harriss, C.E. Kolb, J.B. McManus, J.H. Shorter and B. Lamb (1994). Mapping Urban Sources of Atmospheric Methane. *Geo. Info. Systems*, 4, 34-38.

Harriss, R. C., T. Bense, and D. Blaha. 1993. Methane emissions to the atmosphere from coal mining, in: R. Geyer (ed.) A Global Warming Forum: Scientific, Economic, and Legal Overview, CRC Press, pp. 339-346.

### **Education:**

**1984** B.S. Economics *James Madison University*, Harrisonburg, VA.

**1984 -1986** Graduate Studies, *Whittemore School of Business and Economics, University of New Hampshire*, Durham, NH. (completed two years)

### **Community Engagement:**

**Advisory group, Planet Granite, NH Public Television:** A NHPTV Community Engagement Initiative to promote sustainability issues in New Hampshire.

**Carbon Coalition Steering Committee Member:** Conduct public presentations on climate change and residential action steps on behalf of the Carbon Coalition's Town Meeting Initiative (<http://www.carboncoalition.org>).

**Residential, Commercial, and Industrial Working Group Member of the NH Climate Change Action Plan:** Developed a comprehensive set of actions for the Climate Change Action Plan Task Force to consider in their final report to the governor.

**Grassroots Activist:** Served as campaign director helping elect education advocates to the Nottingham (NH) School Board (2003 – 2006).

**Member, Nottingham (NH) Budget Committee:** Oversee \$11 million dollar combined municipal and school budgets. Twice elected to a three year term.

**William J Armstrong**  
70 Stark Street  
Portsmouth, NH 03801  
603-427-6837  
[wja@sr.unh.edu](mailto:wja@sr.unh.edu)

---

### **Keywords**

Linux, MS-Windows, Java, JavaServer Pages, Java Script, C, Perl, SQL, HTML, XML, CSS, Informix, PostgreSQL, PostGIS, Apache, Tomcat.

### **Employment History**

#### **1998 – present, Software Engineer**

Research Computing Center, University of New Hampshire, Durham, NH

Lead software and development engineer for various web-based applications. These applications are typically built on an object-relational database back end, such as Informix or PostgreSQL and present to the end user via JavaServer Pages (JSP). Work directly with researchers and project managers to understand the requirements for their applications and how they want their data served to end users. Responsible for software technology selection, database schema design, software architecture design, and all software coding. Other responsibilities include hardware purchase decisions, system administration, RAID maintenance and backup, and the creation of automated web administration tools.

#### **1995 – 1998, Test Engineer**

Fibre Channel Consortium, InterOperability Lab (IOL), University of New Hampshire, Durham, NH  
The IOL is a neutral, third-party laboratory dedicated to testing data networking technologies through industry collaboration. Developed, documented, and carried out test procedures on computer networking devices implementing Fibre Channel technology. Organized and participated in large group test events. Worked one-on-one with industry engineers. Hired and supervised UNH student engineers.

#### **1993 – 1995, Test Engineer**

FDDI Consortium, InterOperability Lab (IOL), University of New Hampshire, Durham, NH  
Developed, documented, and carried out test procedures on computer networking devices implementing FDDI technology. Worked one-on-one with industry engineers. Hired and supervised UNH student engineers.

### **Education**

#### **Master Business Administration, 1998**

University of New Hampshire, Durham, NH

#### **BS Electrical Engineering, 1992**

University of New Hampshire, Durham, NH

**Dr. CLAYTON R. MITCHELL, Esq.**  
5 Hilton Drive  
Newmarket, New Hampshire 03857  
clayaz@comcast.net  
(603) 659-6919

**EDUCATION:**

**Ph.D. Natural Resources and Earth System Science.** University of New Hampshire. May 2008. Durham. Dissertation topic: The New Hampshire Land Use Process: Are we Choosing Sprawl. The dissertation assesses the disconnect between community goals and implementation strategies for confronting growth related impacts and sprawl.

**Juris Doctor.** Vermont Law School. May 1996

**Master of Studies in Environmental Law.** Vermont Law School. May 1996  
Aside from traditional legal course of study, completed extensive coursework in a diverse range of environmental issues.

**Bachelor of Arts.** Dual Major in **Anthropology & Classical Archaeology.** University of Arizona, Tucson, Graduation date: August 1991.  
Coursework included Archaeology, Cultural Anthropology, Latin, and Classical History.

**EXPERIENCE:**

**Founding Partner.** SDES Group LLC.  
Founded consulting firm providing energy consultation service and planning.  
Representative tasks include decision and investment grade audits, system installation and municipal energy planning.

**Founding Partner.** MG Planning LLC. Newmarket New Hampshire.  
Founded consulting firm providing municipal land use and legal consultation services.  
Representative clients include the towns of Epping, Middleton, Pelham, Newmarket, Salem, and North Andover, MA. Projects include Open Space Management Plan, Master Plans, Ordinance and Regulation development and general planning services.

**Town Planner.** Town of Newmarket.  
Responsible for busy planning office operations including intensive contact with land owners, citizens, and public officials. Additional responsibilities include creation of an open space protection and management plan, updates to the master plan, ordinances and regulations, and successful application, management, and reports on grants through NOAA, NH Coastal Program, and NROC, creation and management of town-wide GIS system using ArcGIS 9.x for multiple applications.

**Attorney, Of Counsel.** Donahue Tucker & Ciandella. Exeter, New Hampshire.  
As contract attorney and Of Counsel to the firm, responsibilities include drafting of legal memoranda regarding a wide range of issues pertaining to municipal, land use, and zoning law; general representation of clients in municipal matters.

**Senior Planner.** Rockingham Planning Commission. Exeter, New Hampshire.  
Strafford Regional Planning Commission. Dover, New Hampshire.  
Responsible for providing assistance to local communities and region in land use and natural resource planning.

**Planning/Law Intern.** City Planning Office. Lebanon, New Hampshire.  
Responsible for providing the City Planner and Planning Board with research on planning and land use issues. Attended planning board meetings, presented memoranda concerning innovative growth management techniques, urban growth and service boundaries, and transferable development rights.

**Law Intern.** South Royalton Legal Clinic. South Royalton, Vermont.  
Represented low-income clients with a variety of legal issues. Under attorney supervision, met with and advised clients, formulated case strategy, prepared cases for trial and administrative hearings, negotiated settlements, and represented clients in judicial and administrative proceedings.

**Summer Law Intern.** Kane, Jorden, von Oppenfeld & Bischoff. Phoenix, Arizona.  
Summer internship with law firm that handles land use and environmental law cases. Assisted with litigation, strategic planning, research, and court documents. Prepared client opinion letters, legal memoranda, and reports on current trends in various issues of environmental law.

## **EDUCATIONAL ACTIVITIES:**

### **Plymouth State University**

Fall 2005 – Center for the Environment Colloquium – Choosing Sprawl.  
Spring 2006 – Adjunct Faculty – Environmental Law & Policy.

### **University of New Hampshire. Adjunct Faculty and Instructor**

Spring 1999 – Adjunct: Community Development Law CD 717.  
Spring 1999 – Lecturer: Environmental Policy & Politics EC 602.  
Fall 1999 – Lecturer: Continuing Education course “Planning Good Communities”.  
Spring 2000 – Adjunct: Environmental Policy & Politics EC 602.  
Spring 2001 – Lecturer: Continuing Education course “Planning for the 21<sup>st</sup> Century”.

### **NH Office of Energy and Planning. Lecturer.**

1998 - 2007  
Multiple Conference Presentations on: Roles and responsibilities for new planning board members, Energy Efficiency, Regulating Cellular Towers, Innovative land use controls. Zoning Boards and the new variance standard.

### **New Hampshire Bar Association. Lecturer.**

2007 – Energy and Smart Growth, Municipal Continuing Legal Education Seminar.

### **New Hampshire Municipal Association. NH State Law Lecture Series, Lecturer.**

2000 – Innovative Land Use Regulations – Strategies for Implementation.

1999 - Getting the Right Information - Application Review and Procedures.  
1997 - Vested Rights.

**New Hampshire Planner's Association.** Lecturer.

Spring 2007 conference on "Energy and the Planner"

Spring 2000 conference on "Open Space/Cluster Development".

Spring 2001 conference on "Planning Topics for the New Century".

**American Planning Association.** Lecturer.

NNECAPA Conference Speaker – 2006 – Planning, Climate Change, and Energy.

NNECAPA Conference Speaker – 2005 – Preserving Rural Character.

## **PROFESSIONAL RECOGNITION, ASSOCIATIONS, AND ACTIVITIES:**

**New Hampshire Sustainable Energy Association.** Member: President of Board of Directors.

**Northeast Combined Heat and Power Initiative.** Member: Executive Committee.

**New Hampshire Planner's Association.** Member. Executive Board member.

**40 Under 40 in New Hampshire.** Awarded annually to 40 leaders recognized in the State of New Hampshire. 2007 Award.

**New Hampshire Carbon Challenge – Climate Hero.** Awarded to leaders in promoting carbon reductions for communities.

**New Hampshire Bar Association.** Admitted 1997. Membership in Environmental and Natural Resource Law section, and Municipal and Governmental Law section.

**Continuing Legal Education.** Coursework for includes Land Conservation Techniques, Lobbying before the New Hampshire Legislature, and Practical Skills Course, Environmental Law, Municipal Law, and Practical Skills Course.

**American Planning Association.** Northern New England Chapter, Divisions for Small Town and Rural Planning, Environment Natural Resources and Energy, and Land Use Law.

## **Madeline McElaney**

597 Mayhew Turnpike, Plymouth, NH 03264

(603) 536-2484

McElaney@hotmail.com

### **Education**

#### **Masters Degree in Environmental Science and Policy**

***Plymouth State University, Plymouth, NH***

***2006 - Present***

- Completed coursework in Conservation Land Management in NH, Terrestrial Ecology, Environmental Law, GIS.
- Attended a field study course in Ecological Based Landscape Design at the Humboldt Field Research Institute in Steuben, ME.
- Traveled to Southern India to study sustainability and live and work in an ecovillage.

#### **Bachelor of Science, Interdisciplinary Studies - Environmental Biology, Outdoor Recreation, Theater, Plymouth State University, Plymouth, NH**

***1998 - 2002***

- Graduated cum laude.
- Worked with Habitat for Humanity in Marion County, SC and Meals for Many in Washington DC as part of Alternative Spring Break.
- Worked as a teacher's assistant for *Rock Climbing for Beginners* and *Rock Climbing for Women*.

### **Career History**

#### **Program and Outreach Coordinator, New Hampshire Sustainable Energy Association (NHSEA), Concord, NH**

***2008-Present***

- Coordinated workshops & events.
- Developed and produced a monthly newsletter.
- Spoke at community and statewide events.
- Worked with Board Legislative Chair to follow statewide policy initiatives and inform the NHSEA membership on a regular basis.
- Fundraised via revenue from events and grants.
- Collaborated with related sister organizations to promote NHSEA's role as a clearinghouse resource for NH homeowners seeking a more sustainable home and lifestyle.

#### **Education and Membership Coordinator, Plymouth Area Renewable Energy Initiative (PAREI), Plymouth, NH**

***Initiative (PAREI), Plymouth, NH***

***2006 - 2008***

- Educated members on energy conservation topics through presentations, home visits, workshops and written updates.
- Conducted energy assessment and planning sessions at members' homes.
- Participated and helped coordinate volunteer solar "energy raisers".
- Attended conferences on renewable energy and energy efficiency.
- Spoke about/represented PAREI at community events.
- Created and managed membership database.
- Coached and coordinated volunteers.

#### **Intern, Squam Lakes Conservation Society, Holderness, NH**

**Summer, 2008**

- Wrote management plans for fee owned conservation properties.
- Created maps and analyzed data using GIS software ArcView 9.2 & 9.3.
- Visited properties and worked with landowners to create monitoring reports for properties with conservation easements.

#### **Banker II, Citizens Financial Group, Meredith, NH**

***2004 - 2008***

- Worked with individuals and businesses to establish and service bank accounts and loans.
- Awarded Business Banker of the Year in 2007.
- Improved customer service branch rating from 70% to 90%.

### **Activities and Memberships**

- Rock Climbing, Ice Climbing, Hiking, Yoga, Singing, Reading, Gardening, Cooking.
- Member, Rumney Climbers Association, Access Fund,
- Board Member, Plymouth Area Renewable Energy Initiative.

**- References Available Upon Request -**

**UNIVERSITY OF NEW HAMPSHIRE  
OFFICE OF SPONSORED RESEARCH**

**Rate Schedule for Externally-Funded Research and Sponsored Programs**

DHHS Agreement dated April 24, 2008		FY09 7/1/08-6/30/09	FY10 7/1/09-6/30/10	FY11 7/1/10-6/30/11	FY12 7/1/11-6/30/12	FY13 7/1/12-6/30/13
<b>Facilities &amp; Administrative (F&amp;A) Cost Rates<sup>1</sup></b>		-----Provisional-----				
Federally-Sourced: Research on-site		45.0%	45.0%	45.0%	45.0%	45.0%
Federally-Sourced: Instruction on-site		52.3%	52.3%	52.3%	52.3%	52.3%
Federally-Sourced: Other on-site		34.2%	34.2%	34.2%	34.2%	34.2%
Federally-Sourced: All off-site		26.0%	26.0%	26.0%	26.0%	26.0%
<b>State-Sourced: All on-site</b>		<b>35.0%</b>	<b>35.0%</b>	<b>35.0%</b>	<b>35.0%</b>	<b>35.0%</b>
State-Sourced: All off-site		25.0%	25.0%	25.0%	25.0%	25.0%
For Profit: Use Federal rates						
Non-Profit: Sponsor's published rate						
<b>Fringe Benefit Rates<sup>2</sup></b>		-----Provisional-----				
Full rate		40.8%	43.8%	43.8%	43.8%	43.8%
Basic rate		8.4%	8.7%	8.7%	8.7%	8.7%
Postdoc research/teaching associate		28.2%	28.5%	28.5%	28.5%	28.5%
		<b>AY08-09</b>	<b>AY09-10</b>	<b>AY10-11</b>	<b>AY11-12</b>	<b>AY12-13</b>
<b>Graduate Students Stipends<sup>3</sup></b>		-----Estimated-----				
Masters & Doctoral (pre 2 <sup>nd</sup> yr.)	AY	\$14,100	\$14,594	\$15,104	\$15,633	\$16,180
	Summer	9,400	9,729	10,069	10,422	10,787
	Total	\$23,500	\$24,323	\$25,173	\$26,055	\$26,967
Doctoral (post 2 <sup>nd</sup> yr.)	AY	\$15,050	\$15,577	\$16,122	\$16,686	\$17,270
	Summer	10,033	10,385	10,748	11,124	11,513
	Total	\$25,083	\$25,962	\$26,870	\$27,810	\$28,783
Doctoral (advanced to candidacy)	AY	\$16,000	\$16,560	\$17,140	\$17,739	\$18,360
	Summer	10,666	11,040	11,427	11,826	12,240
	Total	\$26,666	\$27,600	\$28,567	\$29,565	\$30,600
<b>Tuition<sup>4</sup></b> <i>(Add \$733 for WSBE, &amp; \$748 for Eng., Computer Sci, &amp; Materials Sci students per year for AY08-09; inflate by 6.0% for subsequent years)</i>	AY	\$9,841	\$10,430	\$11,054	\$11,717	\$12,418
	Semester	\$4,920	\$5,215	\$5,527	\$5,859	\$6,209
<b>Health Insurance<sup>5</sup></b>	AY Plus Summer	\$1,490	\$1,610	\$1,740	\$1,880	\$2,030

<sup>1</sup>The **rate base** for federally-sourced programs is "modified total direct costs" consisting of salaries & wages, fringe benefits, materials, supplies, services, travel, and the first \$25,000 of each sub-award. This base excludes equipment, capital expenditures, tuition, off-site facilities rental, scholarships, fellowships, and the excess of each sub-award over \$25,000. The rate base for all non-federal programs is "total direct costs" unless otherwise specified by sponsor. F&A rates apply to new awards with a start date on or after the effective date of the F&A rate change. The equipment capitalization threshold is \$5,000.

<sup>2</sup> The **full** fringe rate applies to salaries and wages, **except** for hourly and college work study wages, graduate student salaries, and faculty summer and supplemental salaries. The **basic** fringe rate applies to non-student hourly wages, FICA-eligible graduate student pay, faculty summer and supplemental salaries, and other exceptions to faculty and staff contract pay.

<sup>3</sup> The Graduate School's published minimum rates for Academic Year (AY) 08-09. (Actual rates may vary by academic discipline or department.) For budget purposes only, inflate stipends by 3.5% per year after FY08-09. Summer rates represent 13 weeks for full time work; to pro-rate, divide the full summer rate by 13 and multiply by the number of weeks to be worked.

<sup>4</sup> **Tuition** includes the mandatory \$121 technology fee per year for all students. After AY 08-09, tuition is inflated 6% per year and the technology fee by 5% per year for budget purposes only and is subject to change.

<sup>5</sup> **Health Insurance:** For budgeting purposes, use an 8% per year inflation factor after AY08-09.

For budget purposes only, inflate **staff salaries** by 5.5% for FY09 and 3.5% thereafter; **AAUP faculty salaries** by 6.75% for AY08-09, and 3.5% per year thereafter.

**Effective 1/1/09**, reimbursement for **personal vehicle** use is \$0.55 per mile.

ORIGINAL

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN #: 1026000618C4

DATE: April 24, 2008

INSTITUTION:  
University of New Hampshire  
18 Garrison Avenue  
Durham

NH 03824-3547

FILING REF.: The preceding Agreement was dated May 9, 2007

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: FACILITIES AND ADMINISTRATIVE COST RATES\*

RATE TYPES: FIXED FINAL PROV. (PROVISIONAL) PRED. (PREDETERMINED)

TYPE	EFFECTIVE PERIOD		RATE (%)	LOCATIONS	APPLICABLE TO
	FROM	TO			
PRED.	07/01/07	06/30/09	45.0	On-Site	Research
PRED.	07/01/07	06/30/09	52.3	On-Site	Instruction
PRED.	07/01/07	06/30/09	34.2	On-Site	Other Spon Prog
PRED.	07/01/07	06/30/09	26.0	Off-Site	Research
PRED.	07/01/07	06/30/09	26.0	Off-Site	Instruction
PRED.	07/01/07	06/30/09	26.0	Off-Site	Other Spon Prog
PROV.	07/01/09	UNTIL AMENDED	Use same rates and conditions as those cited for fiscal year ending June 30, 2009.		

\*BASE:

Modified total direct costs, consisting of all salaries and wages, fringe benefits, materials, supplies, services, travel and subgrants and subcontracts up to the first \$25,000 of each subgrant or subcontract (regardless of the period covered by the subgrant or subcontract). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, student tuition remission, rental costs of off-site facilities, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of \$25,000.

INSTITUTION:  
University of New Hampshire

AGREEMENT DATE: April 24, 2008

SECTION I: FRINGE BENEFITS RATES\*\*

RATE TYPES: FIXED      FINAL      PROV. (PROVISIONAL)      PRED. (PREDETERMINED)

TYPE	EFFECTIVE PERIOD		RATE (%)	LOCATIONS	APPLICABLE TO
	FROM	TO			
FIXED	07/01/07	06/30/08	41.0	All	All Emp. (2) (3) (5) (6)
FIXED	07/01/07	06/30/08	8.3	All	See Spec. Remarks (4)
FIXED	07/01/07	06/30/08	26.2	All	Post Doc Assoc. (8)
FIXED	07/01/08	06/30/09	40.8	All	All Emp. (2) (3) (5) (6)
FIXED	07/01/08	06/30/09	8.4	All	See Spec. Remarks (4)
FIXED	07/01/08	06/30/09	28.2	All	Post Doc Assoc. (8)
PROV.	07/01/09	UNTIL AMENDED	43.8	All	All Emp. (2) (3) (5) (6)
PROV.	07/01/09	UNTIL AMENDED	8.7	All	See Spec. Remarks (4)
PROV.	07/01/09	UNTIL AMENDED	28.5	All	Post Doc Assoc. (8)

See Special Remarks, (2) (3) (4) (5) (6) (8).

\*\*DESCRIPTION OF FRINGE BENEFITS RATE BASE:  
Salaries and wages.

INSTITUTION:  
University of New Hampshire

AGREEMENT DATE: April 24, 2008

SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:

The fringe benefits are charged using the rate(s) listed in the Fringe Benefits Section of this Agreement. The fringe benefits included in the rate(s) are listed below.

TREATMENT OF PAID ABSENCES:

Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims for the costs of these paid absences are not made.

(1) The rates in this Agreement have been negotiated to reflect the administrative cap provisions of the revisions to OMB Circular A-21 published by the Office of Management and Budget on May 8, 1996. No rate affecting the institution's fiscal period beginning on or after October 1, 1991 contains total administrative cost components in excess of that 26 percent cap.

(2) Fringe benefit rate is not applicable to hourly wages, college work study wages, graduate student salaries, faculty summer salaries.

(3) Fringe benefits include: Eye Care, Early retirement, Additional Retirement Contribution, Earned Time, University Fitness Program, Federal Retirement, Medical Coverage, Other Health Costs, Other Retirement, Other Salary Based, State Retirement, Social Security, Retirement Plan Premiums, Staff and Fac. Tuition Benefits, Workmen's Compensation, Faculty Summer Fellowships, Benefits Administration, ELF, Interim Disability, Sabbatical Leave Salaries and Compensated Absences.

(4) Applicable to Non-Student hourly wages, faculty summer salaries and other exceptions to contract pay. The basic fringe benefit rate is also applicable to FICA eligible graduate student pay.

(5) Applicable to the University System of New Hampshire.

(6) Effective 7/1/99 tuition support for dependents of University of New Hampshire employees is no longer an allowable fringe benefit expense and is not included in the approved rates.

(7) Effective 7/1/05 equipment means an article of nonexpendable, tangible personal property having a useful life of more than one year, and an acquisition cost of \$5,000 or more per unit.

(8) Post Doctoral Research and Teaching Associates rate includes item (4) and applicable health benefits.

This Rate Agreement updates Fringe Benefit rates only.

INSTITUTION:  
University of New Hampshire

AGREEMENT DATE: April 24, 2008

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted; such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which effect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Office of Management and Budget Circular A-21 Circular, and should be applied to grants, contracts and other agreements covered by this Circular, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

University of New Hampshire

(INSTITUTION)

(SIGNATURE)

Taylor Eighmy

(NAME)

Interim Vice President for Research

(TITLE)

April 29, 2008

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

(SIGNATURE)

Robert I. Aaronson

(NAME)

DIRECTOR, DIVISION OF COST ALLOCATION

(TITLE)

April 24, 2008

(DATE) 0572

HHS REPRESENTATIVE: Louis Martillotti

Telephone: (212) 264-2069