1. COVER PAGE

1.1 Program Title: Refrigeration System Heat Recovery Project

1.2 Program Type: Energy efficiency related industrial process and control systems

1.3 Program Summary: This project is focused on recovering waste heat from an industrial refrigeration system and utilizing it as a valuable heating source through the use of heat pump technology.

1.4 Low Income Residential Customer Qualification: N/A

1.5 Identification of Applicant Organization: Stonyfield Farm, Inc.

1.6 Identification of Subcontractors and Partners:

a. Professional Supply, Inc., an energy consulting and engineering company
b. Mechanical and electrical subcontractors that would be determined through a bidding process, which may include: Decco (NH firm), Zajac (ME firm with NH resident employees), Recco (MA firm with NH resident employees), Longchamps Electric (NH firm), CAC Mechanical (NH firm), Controlled Environment Structures, Inc., and Rockwell Automation.

1.7 Authorized Negotiators:

Lisa Drake	Diane Carhart
Senior Natural Resources Manager	Chief Operating Officer
ldrake@stonyfield.com	dcarhart@stonyfield.com
603-437-4040 x3335	603-437-4040

1.8 Projected Energy Savings:

ANNUAL SAVINGS:	24,273 MMbtu (Natural Gas)
NEW ELECTRIC INPUTS:	1,498 MWh/yr (to run pumps, heat pumps)
NET LIFETIME SAVINGS:	$509,826

1.9 Projected GHG Emissions:

Net Annual Savings: 551 metric ton CO2
Net Lifetime Savings: 4404 metric ton CO2

1.10 Length of Program: May through December 2009

1.11 Total Proposed Program Costs: $444,720

1.12 GHGER Funds Requested: $162,807

2. EXECUTIVE SUMMARY

Stonyfield Farm is an organic yogurt manufacturer based in Londonderry, New Hampshire employing 400 people. Stonyfield Farm is seeking to push the envelope in developing best practices for industrial energy efficiency.

This project endeavors to rethink traditional manufacturing facility utility designs. The processing of making yogurt utilizes a significant amount of both process heating and cooling. The traditional way to supply those needs is through separate refrigeration and boiler systems. Stonyfield Farm uses highly efficient natural gas steam and hot water boilers to generate heat and a highly efficient ammonia refrigeration system for cooling. The traditional design of a refrigeration system is that the cooling fluid removes heat from whatever you're trying to cool and that heat is rejected out of the system through a cooling tower. This is exactly how the refrigerator in your home cools its contents and rejects heat through the coils in the back, warming your kitchen.

At Stonyfield Farm, heat that is removed from the ammonia and that heat plus the heat generated by the ammonia compressors is transferred to the cooling tower. For every 1 Btu of cooling generated, about 1.3 Btu of heat is rejected to the atmosphere. In industrial refrigeration system, this is typically pretty low temperature (80F to 100F) heat that is not easily used elsewhere, so it is called "waste heat" and thrown away.

In an innovative and yet really a very simplistic sense, Stonyfield Farm is looking to change the standard approach and rather think of our refrigeration system as a utility that supplies both cooling and heat. This can be accomplished by converting the waste heat to a more usable temperature using heat pump technology to boost the temperature to 130 degrees F. So instead of rejecting heat through the cooling tower while at the same time consuming natural gas to create process heat, this project would allow us to reuse an existing heat source and thereby reduce our natural gas use.

This project, as proposed, does not include the scope or cost investing in additional infrastructure to circulate the low temperature hot water within our facility. This future investment would provide greater options on how, where and when the hot water can be used in our process. This project is envisioned as a first step of optimizing the delivery of heating needs with future steps possibility including eliminating steam from our facility in favor of more efficient hot water and generating all hot water from either recovered sources of waste heat and renewable or co-generated sources of hot water.

This project is an excellent energy efficiency and sustainability model, optimizing designs to think in cycles and reuse rather than one way input/output. It is a retrofit that can readily be applied to other manufacturing facilities with process cooling and heating requirements.

By recovering this significant source of heat, the process heating requirements of the facility will be diminished, making it possible to not only reduce natural gas used in the manufacturing facility, but also to rely on one steam boiler, rather than two, to meet heating requirements.

The potential savings for these measures have been estimated based on an extensive review of energy use through our BarExpert energy monitoring system. BarExpert is an extensive, facility-wide energy monitoring and recording system, used as a tool for better understanding energy use patterns and loads in order to identify opportunities to reduce loads and peaks. This system measures pressures, temperatures, flows, watts, gas flow and other measures of utility function and energy use.

The projected annual savings are 24,273 MMbtu/year in natural gas, although the additional pumping requirements and use of heat pumps will add electrical load of an estimated 1,498 MWh/year. In terms of GHG reductions, this equates to a net reduction of 551 metric tons of CO2 eliminated annually.

The costs of the project are estimated at $444,720 and the work would be completed by December 2009. The majority of the project would be funded by a combination of Stonyfield Farm and through energy efficiency rebates anticipated from our gas utility, but is seeking $162,807 in GHGER funding. While we strongly desire to complete this project, we must also consider that the manufacturing facility will both continue to run well without this project. All capital projects at Stonyfield Farm compete for funds against factories around the globe within Groupe Danone, who owns a majority of Stonyfield. Like most corporations, Groupe Danone generally does not fund non-critical capital projects with paybacks longer than two years. In order to make this project financially attractive for capital funding, the GHGERF funding requested for this project equates to the additional funds needed to bring the project to a two year simple payback.

We are committed to sharing our knowledge and experience for the benefit of the environment and the economy. We will readily share information about the investment, conceptual design and operation of this system with the PUC or others, as well as the benefits realized from this project. Furthermore, we are happy to open our doors to those interested in seeing our facility and how these projects have been implemented.

Our partners in this work include:

- Project Engineers and Project Management: Professional Supply, Inc., an energy consulting and engineering firm
- Mechanical and electrical subcontractors that would be determined through a bidding process, which may include: Decco, Zajac, Recco, Longchamps Electric, CAC Mechanical, Controlled Environment Structures, Inc., and Rockwell Automation

3. PROPOSED SCOPE OF WORK AND SCHEDULE

Work Plan

The project would be contracted, managed and overseen by Stonyfield Farm engineering staff. Day to day project management would be done by PSI. The work would be conducted by mechanical and electrical subcontractors that would be selected through a competitive bid process.

Task 1:
Preliminary Engineering Study
To be completed by: PSI

Subtask 1a: Field engineering verification
Validate and verify design assumptions and existing equipment operation
Develop existing energy baseline

Subtask 1b: Develop Conceptual Design
Develop the following deliverables:

- Existing process and energy analysis
- Concept narratives
- Scope of Work documents for contractors
- Concept drawings
- Process controls schematics
- Mechanical P&ID Drawings
- Schedule of drawings required in Detailed Design
- Investment analysis based on contractor quotes for installation
- Proposed construction schedule
- Final system recommendation with proposed energy costs and savings

Task 2:
Engineering Design
To be completed by: Professional Supply, Inc.
All aspects of conceptual design to be developed into detailed plans and specifications

Task 3:
Installation and Start-Up
To be completed by: mechanical and electrical subcontractors. Construction management to be provided by PSI.
(Sub-tasks to be confirmed based on results of Task 1)
Installation of heat recovery equipment and heat pumps
Install controls and programming to BarExpert system

Task 4:
Verification and Reporting
To be completed by:

Verification: To be determined.

Reporting: Stonyfield Farm, Inc.
Use BarExpert energy monitoring system to verify energy savings.
Use weekly meter data and monthly invoices to verify energy savings.
Complete report on project outcomes and learnings.

Task 5:
Project Management and Administration
Stonyfield Farm expects to contribute at least 60 hours to project management and administration.

Project Schedule

This project is ready to start as soon as all necessary funding is secured. Assuming a project start in mid-May, the proposed schedule would accomplish completion by December 2009.

Preliminary Engineering Report Begin:	May 2009
Preliminary Engineering Report Completed:	June 2009
Detailed Design Begins:	June 2009
Detailed Design Completed:	August 2009
Installation Begins:	September 2009
Installation Completed:	October 2009
Start Up Begins:	November 2009
Start Up Completed:	November 2009
Monitoring & Verification Begins:	November 2009
Reporting & Project Closing:	December 2009

Project Oversight, Quality Assurance Measures and Financial Management

Stonyfield Farm Engineering staff would provide project oversight, including Laura Hamlet, Senior Director of Engineering and Maintenance, and Jeffrey Shuman, Project Engineer. The project would be implemented with a design/build performance contract where PSI is responsible for delivering the expected results and guarantee the savings financially.

PSI will focus on identifying and allocating all energy needs for the Ammonia Heat Recovery Project. This process will enable PSI to direct the design team to make the necessary changes in the system design that reflect the energy goals of this project. This overall effort and energy design coordination would ensure that the objectives, vision and design aspects of the project will be met through the best practices of energy efficiency and sustainable engineering design. The utilization of PSI would bring to Stonyfield Farm one simple network and standardization of metering and data processing in one overall energy plan. PSI's role assures Stonyfield Farm that PSI will work with the design team to meet the energy goals and vision that were outlined during the Preliminary Engineering Report and detail design phases of the project, all the way through start up and final commissioning of the system.

PSI would work in cooperation with all the key parties of the development and design team, in particular with the selected MEP firm and contractor to achieve the desired results. PSI would

oversee and coordinate all Preliminary and Detail Engineering Designs for the Ammonia Heat Recovery project. This involvement ensures that all aspects of the design meet the energy model developed by PSI. The Energy Coordinator and PSI would interface with the A/E of Record and MEP firm to execute detail engineering documents for mechanical, electrical power and piping based on the Concept Drawings and P&ID's that PSI will provide to them. PSI would be responsible for all controls and software design in order to guarantee overall system performance. As a result, PSI will be responsible and held accountable for System Designs and System Performance Guarantees.

Verification of the results would be accomplished using the BarExpert energy monitoring system.

Financial management would be accomplished by both Stonyfield Farm staff and PSI. The design/build contract between Stonyfield Farm and PSI will commit PSI to delivering the project at a specified cost. PSI will develop detailed project specifications for bidding that will ensure delivery of expected outcomes while controlling subcontractor costs.

4. PROJECT BENEFITS

4.1 GHG Reductions

The energy savings that would be accomplished through this project would reduce Stonyfield Farm's facility energy related greenhouse gas emissions by a net 551 metric tons annually and an estimated 4404 metric tons over the lifetime of the project.

4.2 Cost Effectiveness

As detailed in the Cost Effective Analysis spreadsheet, the project provides a good benefit/cost (B/C) ratio. The B/C ratio for the project is 0.95, and 2.59 for GHGER funds. With the avoided CO2 costs, the B/C ratios improved to 1.61 and 4.39, respectively.

4.3 Reduce Peak Load

This project would reduce Stonyfield Farm's peak natural gas loads but will add electrical load for heat pumps. Therefore this project will likely have a negative overall impact on our electrical peak load, however with the positive benefit of overall GHG reductions.

4.4 Promote Market Transformation

Stonyfield Farm is looked to as a leader within our parent company, our industry and our state, particularly when it comes to environmental and energy initiatives. Our active pursuit of energy efficiency opportunities, beyond the typical low hanging fruit, sets a new standard for utility system management. Lessons learned and solutions developed through this project are readily applicable to any other manufacturing facilities with process heating and cooling requirements. This project can influence the creation of smarter energy design at these kinds of facilities in the future.

We readily share our knowledge and learnings with others including our counterparts at other dairy facilities owned by our parent company, peers in our industry and other businesses through networking, publicized case studies and speaking engagements.

Our parent company, Groupe Danone, operates dairy manufacturing facilities all around the world, all with similar heating and cooling designs to the one we use today. As Stonyfield proves the value of this innovative approach to recapturing what is viewed as "unusable, waste heat", similar retrofits would be implemented throughout the world. Energy projects undertaken in the past few years at Stonyfield Farm are currently being replicated at other dairy facilities in the U.S. and the Groupe recognizes Stonyfield as a testing ground for innovative approaches to energy efficiency, utility systems and sustainability.

4.5 Promote Innovative Technologies

This project is about optimizing an existing design through innovative heat recovery and heat pump technology. The standard approach in the industry is to think of refrigeration systems and

process heating systems as entirely independent entities. This project would demonstrate a new way of thinking about interdependence and synergy between these types of systems.

Additionally, there are some misconceptions about heat pump technology that needs to be addressed. Due to poor heat pump equipment and designs implemented in previous decades, it is a common misconception that heat pump use more energy than they recover. The truth is that using advanced heat pump technology, at our operating temperatures, the heat pumps can run at a coefficient of performance (COP) of greater than six (6). That means that for every 1 Btu of electric energy consumed by the heat pump, 6 Btu of heating energy will be generated as 130 degree F hot water. Therefore this is a great case study to document and publicize the opportunities for GHG reductions using heat recovery.

4.6 Promote Economic Development

The investment in this project would leverage nearly a half million dollars in total spending in 2009. The majority of the work would be completed by subcontractors that include New Hampshire based firms and New England based firms that employee residents of New Hampshire, thereby keeping the majority of the project dollars in the state. This project would also demonstrate ways that other manufacturing facilities can be more profitable by reducing energy costs.

4.7 Promote Energy Cost Savings

Through this project, Stonyfield Farm expects to save approximately 24,273 MMbtu/year in natural gas with first year net dollar savings equal to $102,073. Over the lifetime of the project, that is approximately $500,000 in savings.

4.8 Promote Collaboration and Provide Useful Information for Future Program Evaluation and Improvement

We are happy to share with information about the investment, design and operation of this system with the PUC or others, as well as the benefits realized from this project.

4.9 Otherwise Consistent with the Public Interest and the purposes of RSA 125-O:19.

This project aligns precisely with at least two of the recommendations in the New Hampshire Climate Action Plan. RCI Action 3.1 encourages an increase in renewable energy and low CO2 emitting thermal energy systems. Certainly this is an innovative “low CO2 emitting” thermal energy system. RCI Action 2.1 promotes the installation of higher efficiency equipment, processes and systems and again, this project very much fits the bill. The implementation of this proposed project is an excellent example and case study that would yield results and information that could greatly inform the design of future projects or programs that may ultimately result from the Climate Action Plan.

5. MEASUREMENT AND VERIFICATION

Success of this project is defined as meeting or exceeding the energy savings presented in this proposal. The actual savings and verification of performance of the system will be accomplished using the BarExpert energy monitoring system. With the programming to be completed, we will know exactly how much energy is transferred between the refrigeration system and our heating loads, as well as how much electrical energy is being used by the heat pumps. We will have very good data to demonstrate the success of the project.

The PSI monitoring and verification program is an extension and or continuation of the Preliminary Engineering Report and Detail Design phase. In other words, the system performance and energy usage is continually monitored and verified through sub-metering against the agreed upon energy baseline that was developed in the Preliminary Engineering Report. PSI meters or has a metering strategy for every new piece of equipment in the project which allows PSI and Stonyfield Farm to optimize system efficiency and savings through better control and awareness. The meters and sub-meters on the equipment helps to insulate this project from other savings projects or changes at the site such as building expansion, new process lines or a new savings project by different company. Studies have shown that just sub metering alone can help to reduce usage by 5-10%.

Monitoring and Verification activities include daily dial up and download of the energy usage and system performance to evaluate and benchmark against the baseline energy usage. PSI will make monthly site visits to verify preventative maintenance activities are being completed per the PM schedule provided by PSI in the Preliminary Engineering Report and at the PSI provided training session upon completion of system start up.

The daily M&V activities included reviewing all alarms, overrides and warning logs that have occurred and address them with the appropriate personnel. PSI will provide an immediate response via email or phone the contact person at the site to get the issue and/or problem resolved quickly. Verification of the historical data download is complete in order to compare the energy usage versus baseline energy.

The monthly M&V activities include monthly site visits to verify PM are being completed properly and provide maintenance personnel answers to any questions or concerns that they have regarding the preventative maintenance activities. PSI will inventory all of the spare parts and prepare monthly report.

The benefit of the PSI M&V program is that M&V is a team effort from everyone involved with the project. There is real time monitoring of job and tracking component life cycle of all equipment, including tracking of the PM completions on all work orders and on-site trips to review system operation/ performance and maintenance. Additionally, M&V provides trades and supervisors with face to face contact with PSI and therefore, not just a name and phone number, to identify training needs of plant trades. Finally, M&V sustains the efficiency of the system which saves energy and ultimately reduces greenhouse gases.

Quality Assurance would be accomplished primarily by PSI would complete the preliminary engineering, develop the detailed design and specifications for the solution and oversee the implementation of the work, and ultimately be held accountable through a financial performance guarantee.

6. BUDGET

The proposed budget for this project is presented on the following two pages. The GHGERF budget worksheet is included showing the dollars for the project as a whole. The second spreadsheet breaks down the costs by project task. The majority of the project costs were developed by Stonyfield Farm. The actual costs will be refined in the early stages of the project after the completion of the preliminary engineering report.

The scope of the project is quite discreet and does not appear to fit the "minimum and maximum" budget options provided in the budget worksheet and therefore we are not offering a minimum nor maximum budget at this time, but rather the costs required to complete the full scope of the project.

The funds requested leverage significant other funds, primarily from the proposed grantee, Stonyfield Farm, Inc. We are also researching funding support from our gas utility in the form of energy efficiency rebates.

The expense of Stonyfield Farm staff hours has been included and shown as "applicant in-kind contribution". The remainder of the project is capital investment in our facility and therefore has been included under "Capital Invested in Building Improvements".

The dollar figure requested from the GHGERF by Stonyfield Farm is the estimated amount needed to bring this project to a two year simple payback. The calculation has included an assumed $100,000 in energy efficiency rebates from our gas utility even though that has not yet been committed. With internal and external competition for capital dollars going to capacity building and other critical needs, energy investments must provide a short payback and good internal rate of return. With the support of the GHGERF, we will ensure that this project is completed and the potential savings and emission reductions are realized.

Spreadsheet #1

Spreadsheet #2

7. APPLICANT QUALIFICATIONS

Stonyfield Farm, Inc. has a strong team of engineering and environmental professionals who have experience in developing and executing successful energy efficiency projects in manufacturing facilities. We are experts in the design, operation and maintenance of our utility systems. Key team members include:

Laura Hamlet: Senior Director of Engineering & Maintenance
Laura would provide overall direction on the project

Jeffrey Shuman: Utility and Wastewater Engineer
Jeff would be Stonyfield Farm's project manager and technical expertise on the project

Lisa Drake, P.E.: Senior Natural Resources Manager
Lisa brings environmental expertise to the project and would be primarily responsible for communications, collaboration and knowledge sharing and transfer

Please see attached resumes.

Our partners in this project and their key personnel include:

Professional Supply, Inc.:

Ed Kiser, Project/Mechanical Engineer
Tom Kiser, CEO and President
Eric Freimark, Engineering Project Manager
Dave Engeman, Electrical Controls Engineer
Duane Cook, Mechanical Engineer
Randy Abbott, Electrical Engineer
James Richardson, Technical Director
Russ Kiser, Director of Performance Contracting

COST EFFECTIVENESS ANALYSIS. GHG REDUCTION CALCULATIONS AND SAVINGS SUMMARY

LETTERS OF INTEREST

QUALIFICATIONS AND RESUMES