

**MTAF Round 3
 Notice of Intent Submissions
 Sector: Advanced Technologies for
 Forestry and Agriculture**

MTAF #	Project Title	Name	County	State	Amount (\$)
3006	Biomass Torrefaction Technology	Torrefaction Technologies LLC	Cumberland	ME	750,000.00
3009	Chromatography system for analysis of bioactive compounds in Maine agriculture	University of Maine	Penobscot	ME	750,000.00
3013	Commercialization of new technologies for equine disease surveillance	University of Maine	Penobscot	ME	500,000.00
3015	Insect & Plant Disease Identification & Management Laboratory & Office Expansion	University of Maine	Penobscot	ME	2,400,000.00

Form Data 'fIA Um\$' z&\$%\$ 'Uh%% \$&.% '5A Ł

1. Project Title. Character limitation: 80 including spaces.

Project Title Biomass Torrefaction Technology

2. Lead Institution

Name Torrefaction Technologies LLC

Lead Organization Type: Choose One

Profit

Mailing Address 1 PO Box 17536

Mailing Address 2 None given.

City Portland

County Cumberland

State ME

ZIP 04112

3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.

Rep. First Name Drew

Rep. Last Name Swenson

Rep. Title President

Rep. Institution Torrefaction Technologies USA LLC

Rep. Telephone 207-775-2464

Rep. Email Address dswenson@torrefactiontechnologies.com

Rep. Mailing Address 1 PO Box 17536

Rep. Mailing Address 2 None given.

Rep. City Portland

Rep. State ME

Rep. ZIP 04112

4. Project Director: Scientific lead and/or project manager.

Dir. First Name Drew

Dir. Last Name Swenson

Dir. Title President

Dir. Organization Torrefaction Technologies USA LLC

Dir. Mailing Address 1 PO Box 17536

Dir. Mailing Address 2 None given.

Dir. City Portland

Dir. State ME

Dir. ZIP 04112

Dir. Telephone 207-775-2464

Dir. Email Address dswenson@torrefactiontechnologies.com

Dir. Fax 207-775-4440

5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."

Collaborators University of Maine

6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.

Amount (\$) 750000

7. Technology Sector

Chose One Sector Advanced Technologies for Forestry and Agriculture

8. Scientific Disciplines Involved. Character limitation: 125 including spaces.

Scientific Disciplines Involved

Slow pyrolysis of biomass to create multiple value added, renewable energy and carbon sequestration products.

9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."

Reviewer 1 None

Reviewer 2 None given.

10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."

Withhold from WITHELD BY MTI

11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.

Character limitation: 6,000 including spacing

Description Area	<p>Pyrolysis is the chemical decomposition of substances by heating that occurs spontaneously at high enough temperatures. The word is coined from the Greek-derived pyro "fire" and lysis "decomposition." ♦Torrefaction♦ of biomass can best be described as slow pyrolysis at temperatures typically ranging between 200-300♦ C. Torrefaction is similar to the method used to dry and roast coffee beans. Our invention will torrefy biomass to create 1) char for co-firing in coal plants, 2) activated carbon for air and water filtration systems and 3) bio-char for soil enhancement. A great deal of experimentation, research and development has been undertaken around the world to design a commercial torrefaction system. Most such torrefaction designs have failed or proven to be cost prohibitive because they rely on the use of hot gases as the thermal medium, which does not appear to work physically or financially on a commercial scale. Our invention is different. By using a heated, organic solven as the thermal conversion medium, our innovative technology 1) acts as a heat sink to avoid spontaneous combustion, 2) reduces the energy required in the process and 3) increases the energy content of the biomass by 35+%; above that of coal. We do not yet have a fully designed continuous flow reactor system. It will initially be designed to fit on a flat bed trailer. Larger fixed site systems will come later. The mobile design will require roughly \$150,000 to \$250,000 to cover design costs and another \$400,000 to \$500,000 for equipment and fabrication of a pilot system. We will work with the University of Maine's Process Engineering team, Advanced Manufacturing Center and Pulp and Paper Department to design, test and commercialize the technology. If, as we fully expect, the design is viable, we estimate the company will be able to rapidly commercialize the technolgy and this will create 30-60 Maine manufacturing jobs, 3 operating jobs per mobile system and 10 jobs for each fixed site system. There will also be an increase in Maine transportation and logistics jobs, but we do not yet have a good sense of those full time equivalents.</p>
------------------	--

Please review your submission carefully.

The Notice of Intent must be filed electronically with MTI no later than noon, Tuesday, May 4, 2010. Late submissions will not be accepted.

Send this Notice of Intent to Apply to the Maine Technology Asset Fund by clicking the Submit button directly below. Your proposal is not submitted until you click the submit icon.

Upon MTI's receipt of the electronically submitted Notice of Intent, you will receive an automatically generated acknowledgement of the receipt. An e-mail acknowledgment will also be sent to the Project Director.

In addition, within two business days MTI will send an e-mail to the Project Director providing an application number to be included on each page of the formal application, and an acknowledgement that the Notice of Intent is complete.

Form Data 'fIA Um\$' z&\$%\$ 'Uh\$' .' - . \$) 'DA Ł

1. Project Title. Character limitation: 80 including spaces.

Project Title Chromatography system for analysis of bioactive compounds in Maine agriculture

2. Lead Institution

Name University of Maine

Lead Organization Type: Choose One

Academic

Mailing Address 1 Office of Research and Sponsored Programs

Mailing Address 2 5717 Corbett Hall

City Orono

County Penobscot

State ME

ZIP 04469-5717

3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.

Rep. First Name Michael

Rep. Last Name Hastings

Rep. Title Director, Office of Research & Sponsored Programs

Rep. Institution University of Maine

Rep. Telephone 207-581-1484

Rep. Email Address umgrants@maine.edu

Rep. Mailing Address 1 5717 Corbett Hall

Rep. Mailing Address 2 None given.

Rep. City Orono

Rep. State ME

Rep. ZIP 04469-5717

4. Project Director: Scientific lead and/or project manager.

Dir. First Name Brian

Dir. Last Name Perkins

Dir. Title Project Director

Dir. Organization University of Maine

Dir. Mailing Address 1 Dept. Food Science & Nutrition

Dir. Mailing Address 2 Hitchner Hall

Dir. City Orono

Dir. State ME

Dir. ZIP 04469

Dir. Telephone 207-581-1369

Dir. Email Address bperkins@maine.edu

Dir. Fax 207-581-1636

5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."

Collaborators Beacon Analytical Systems, Scarborough, ME Maine Medicinals, Dresden, ME Laurie Connell, UMaine Rodney Bushway, UMaine Mary Ellen Camire, UMaine Dorothy Klimis, UMaine

6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.

Amount (\$) 750000"

7. Technology Sector

Chose One Sector Advanced Technologies for Forestry and Agriculture

8. Scientific Disciplines Involved. Character limitation: 125 including spaces.

Scientific Disciplines Involved

Food Science, Agriculture, Analytical Chemistry, Biochemistry, Aquaculture, Nutrition

9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."

Reviewer 1 None

Reviewer 2 None given.

10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."

Withhold from None

11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.

Character limitation: 6,000 including spacing

Description Area	We propose the acquisition of an ultra pressure liquid chromatograph with a tandem time of flight ♦ triple quadrupole mass spectrometer detection system (UPLC/Q-TOF). This instrumentation will serve as the cornerstone for a collaborative effort focusing on the identification and quantification of a wide variety of bio-active compounds (nutritive and toxic) in biological systems. The UPLC/Q-TOF system, which represents a substantial improvement in analytical capabilities at UMaine, is crucial to the integration of current and proposed investigations focused in the emerging field of metabolomics. Characterizing the effects of healthful and toxic components of certain fruits, vegetables and seafoods grown or harvested in Maine will enhance current understanding of human health and disease on a cellular level. Understanding the fate and metabolism of the naturally occurring paralytic shellfish toxins in other biological systems is of concern, particularly to those consumers at the top of the biological food chain. The discovery of beneficial bioactive compounds in Maine-grown fruits and vegetables and their role in human health represents new and exciting possibilities for value-added Maine food products. This collaborative effort links academic disciplines with biotechnology and agricultural industries to create a symbiotic research and training program that will yield benefits for University of Maine research capabilities as it enhances the Maine economy. We will work closely with Maine♦s developing elderberry industry (growers, processors and researchers) as well as the blueberry industry and a small, innovative biotechnology firm that develops rapid assays for the global market. Research and training opportunities will be shared by a diverse constituency which includes faculty, staff, graduate and undergraduate students, selected local high school students, and a wide variety of scientific collaborators.
------------------	---

Please review your submission carefully.

The Notice of Intent must be filed electronically with MTI no later than noon, Tuesday, May 4, 2010. Late submissions will not be accepted.

Send this Notice of Intent to Apply to the Maine Technology Asset Fund by clicking the Submit button directly below. Your proposal is not submitted until you click the submit icon.

Upon MTI's receipt of the electronically submitted Notice of Intent, you will receive an automatically generated acknowledgement of the receipt. An e-mail acknowledgment will also be sent to the Project Director.

In addition, within two business days MTI will send an e-mail to the Project Director providing an application number to be included on each page of the formal application, and an acknowledgement that the Notice of Intent is complete.

Form Data 'fIA Um\$' z&\$%\$ 'Uh\$(. % .%{ 'DA Ł

1. Project Title. Character limitation: 80 including spaces.

Project Title Commercialization of new technologies for equine disease surveillance

2. Lead Institution

Name University of Maine

Lead Organization Type: Choose One

Academic

Mailing Address 1 Office of Research & Sponsored Programs

Mailing Address 2 5717 Corbett Hall

City Orono

County Penobscot

State ME

ZIP 04469-5717

3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.

Rep. First Name Michael

Rep. Last Name Hastings

Rep. Title Director, Office of Research & Sponsored Programs

Rep. Institution University of Maine

Rep. Telephone 207-581-1484

Rep. Email Address umgrants@maine.edu

Rep. Mailing Address 1 5717 Corbett Hall

Rep. Mailing Address 2 None given.

Rep. City Orono

Rep. State ME

Rep. ZIP 04469-5717

4. Project Director: Scientific lead and/or project manager.

Dir. First Name Robert

Dir. Last Name Causey

Dir. Title Dr.

Dir. Organization University of Maine

Dir. Mailing Address 1 Dept of Animal & Veterinary Sciences

Dir. Mailing Address 2 5735 Hitchner Hall

Dir. City Orono

Dir. State ME

Dir. ZIP 04469

Dir. Telephone 207-581-2782

Dir. Email Address robert.causey@umit.maine.edu

Dir. Fax 207-581-2729

5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."

Collaborators James Weber PhD, DVM, Animal and Veterinary Sciences, UMaine Anne Lichtenwalner DVM, PhD, Cooperative Extension, UMaine

6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.

Amount (\$) 500000"

7. Technology Sector

Chose One Sector Advanced Technologies for Forestry and Agriculture

8. Scientific Disciplines Involved. Character limitation: 125 including spaces.

Scientific Disciplines Involved

Equine infectious diseases, epidemiology, veterinary medicine

9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."

Reviewer 1 None

Reviewer 2 None given.

10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."

Withhold from None

11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.

Character limitation: 6,000 including spacing

Description Area	According to the Maine Farm Bureau, Maine is home to 35,000 horses, with an economic impact of approximately \$364 million. Because of extensive sea and land borders, Maine is on the front lines of national human and animal biosecurity, and at risk for outbreaks of diseases in animal populations. The economic impact of such disease outbreaks can be severe to both individual farms, and the state as a whole. Maine is also home to a strong biotechnology sector. We wish to develop a program at UMaine focused on strengthening biosecurity of our horse population as a way to protect the equine economy. In addition, we wish to foster innovation and commercialization of new technologies of equine disease surveillance by Maine's biotechnology sector. For both objectives we wish to use specific diseases of importance to Maine's equine industry as a focal points for training, research, and product development.
------------------	---

Please review your submission carefully.

The Notice of Intent must be filed electronically with MTI no later than noon, Tuesday, May 4, 2010. Late submissions will not be accepted.

Send this Notice of Intent to Apply to the Maine Technology Asset Fund by clicking the Submit button directly below. Your proposal is not submitted until you click the submit icon.

Upon MTI's receipt of the electronically submitted Notice of Intent, you will receive an automatically generated acknowledgement of the receipt. An e-mail acknowledgment will also be sent to the Project Director.

In addition, within two business days MTI will send an e-mail to the Project Director providing an application number to be included on each page of the formal application, and an acknowledgement that the Notice of Intent is complete.

Submission Metadata

IP 127.0.0.1

Browser Mozilla/4.0 (compatible; MSIE 7.0; Windows NT 5.1; .NET CLR 1.1.4322; InfoPath.2)"

Form Data 'fIA Um\$' z&\$%\$ 'Uh\$(.&* .)\$ 'DA Ł**1. Project Title. Character limitation: 80 including spaces.**

Project Title Insect & Plant Disease Identification & Management Laboratory & Office Expansion

2. Lead Institution

Name University of Maine

Lead Organization Type: Choose One

Academic

Mailing Address 1 Office of Research & Sponsored Programs

Mailing Address 2 5717 Corbett Hall

City Orono

County Penobscot

State ME

ZIP 04469-5717

3. Authorized Institutional Representative: Primary contact for the Lead Organization, who may or may not be the same as the Project Director. If the same as the Project Director, enter Project Director in each required box.

Rep. First Name Michael

Rep. Last Name Hastings

Rep. Title Director, Office of Research & Sponsored Programs

Rep. Institution University of Maine

Rep. Telephone 207-581-1484

Rep. Email Address umgrants@maine.edu

Rep. Mailing Address 1 5717 Corbett Hall

Rep. Mailing Address 2 None given.

Rep. City Orono

Rep. State ME

Rep. ZIP 04469-5717

4. Project Director: Scientific lead and/or project manager.

Dir. First Name James

Dir. Last Name Dill

Dir. Title Pest Management Specialist

Dir. Organization University of Maine Cooperative Extension

Dir. Mailing Address 1 491 College Ave

Dir. Mailing Address 2 None given.

Dir. City Orono

Dir. State ME

Dir. ZIP 04469

Dir. Telephone 207-581-3879

Dir. Email Address james.dill@maine.edu

Dir. Fax None given.

5. Collaborators, if Known: List either individual name and/or institution. If none, enter "None."

Collaborators ME Dept of Agriculture; ME Dept of Health and Human Services; Department of Homeland Security, Animal and Plant Health Inspection Service; and Northeast Plant Diagnostic Network.

6. Approximate amount of funds requested. Please use numbers only without special characters, such as decimal point and commas. For example: 500000.

Amount (\$) 2400000

7. Technology Sector

Chose One Sector Advanced Technologies for Forestry and Agriculture

8. Scientific Disciplines Involved. Character limitation: 125 including spaces.

Scientific Disciplines Involved

Plant Pathology, Entomology, Biology, and Horticulture.

9. Names of two suggested reviewers from outside Maine, who are expert in the area of work with no direct conflicts of interest. Please list names and institutional affiliation. MTI is under no obligation to use these reviewers. If none, enter "None."

Reviewer 1 Dr. John E. Ayers The Pennsylvania State University Professor of Plant Pathology Director, Pesticide Education Program (www.pested.psu.edu/)Co-Director, Northeastern IPM Center (www.neipmc.org/) 114 Buckhout Laboratory University Park, PA 16802 814-865-7776 jea@psu.edu

Reviewer 2 Dr. George Hamilton Extension Specialist in Pest Management and Professor of Entomology Department of Entomology 93 Lipman Drive Rutgers University New Brunswick, NJ 08901 732-932-9801 hamilton@aesop.rutgers.edu

10. Names and institutional affiliation of potential reviewers from whom to withhold application information. If none, enter "None."

Withhold from None

11. Project Overview, which includes a brief description of proposed project, including use of award funds; scientific rationale of the proposed project; potential economic impact areas; a listing of organizations participating in the project and a brief description of their roles.

Character limitation: 6,000 including spacing

Description Area The billion dollar Maine agriculture industry is the most diverse agricultural system in New England. Currently, the primary concern of growers throughout the state pertains to increasing productivity while lowering production costs. In order to ensure the sustainability and economic viability of Maine's agricultural industry, timely and efficient management of pests is crucial. A successful integrated pest management (IPM) program can not only potentially reduce production costs through decreased pesticide applications but, through the use of effective monitoring techniques, can ultimately save growers millions of dollars in potential crop losses. IPM programs, such as those offered by the University of Maine Cooperative Extension Service, can play a pivotal role in supporting Maine agriculture by offering support directly to growers and indirectly through collaboration with private consultants. Every agricultural commodity produced in Maine has a strong link to the University of Maine through our Insect and Plant Disease Identification Clinic. This proposal would enhance and expand the Clinic's IPM programs while providing greater service to the people of Maine. According to the Maine 2008 Business Directory there are 457 landscape companies and 84 pest control companies in the state. There are also approximately 15 agricultural consulting businesses in Maine. According to Drs. James McConnon and Todd Gabe, Professor and Assistant Professor of Resource Economics and Policy respectively, the investment in an expanded Insect and Plant Disease Identification and Management Laboratory has the potential to create 550 direct jobs valued at over \$14 million and another 275 support jobs with a minimum impact value of \$4 million. The proposed facility has the potential to not only increase economic employment opportunities but also to preserve much needed jobs in rural communities across Maine. In order to achieve the benefits associated with this proposal, we are requesting \$2,000,000 to expand our facilities and \$400,000 for enhanced laboratory equipment. Currently, our programs have been experiencing between a five and thirty to one return on investment, according to the 2008 USDA PPRS Database. The potential exists for over a seven to one return on investment just from the newly created jobs associated with this proposal. When factoring in the other aspects related to the proposed facility, including grower savings, infrastructure investments, and new business opportunities, the potential exists for a much greater return on investment over the next five to ten years. The new laboratory will include a separate entomology and plant pathology laboratory and receiving area, augmented with a joint,

biosecure entomology and plant pathology lab. These labs will be contiguous which will make this facility unique in the Northeast. The facility will include an arthropod rearing facility which will include biosecure containment cages, small growth chambers, and a greenhouse. The plant pathology lab will also have small growth chambers, a biosafety cabinet and other plant pathology related equipment. The shared, biosecure laboratory will contain a walk-in growth chamber and other safety related equipment. This equipment will allow for the handling of high-risk organisms for identification. There will also be supporting space for offices, meeting rooms, storage, bathrooms, and safety showers. The equipment is crucial to help us quickly and accurately identify many organisms we do not have the ability to identify now in support of our agricultural industries. The current facility is supplied with limited lab equipment, some of which has been in use for 20 years or longer. Despite the low level of sophistication, the Clinic has managed to impart millions of dollars in savings to the agricultural, forestry, ornamental plant, and commercial sectors of Maine that are commonly plagued by pest problems. The potato industry alone saved over \$26 million in 2009 through the management of late blight and other potato pests through work that emanates from our lab. In 2007, apple growers, whose crop had a \$25,800,000 economic impact to Maine, reported reductions in pest damage of 35%, while also reporting pesticide savings of \$245 per acre. These savings were made possible through proper pest identification and using the Apple IPM Program's pest management suggestions. Through pest identification and timing of management, strawberry and sweet corn growers reduced both production costs and the use of pesticides in 2008, thus realizing savings of about \$180 per acre for strawberries and \$240 per acre for sweet corn. The proposed facility has the potential to not only increase these savings but to also extend savings to other commodities and sectors affected by pest populations. Maine farmers, businesses, and homeowners consistently face a wide array of pests that threaten commodities, buildings, and health. Proper management techniques typically allow farmers to successfully grow crops, businesses to manufacture and sell products, and citizens to live safely. Yet effective, safe management of pests is becoming more challenging. There are an increasing number of emerging pests and diseases that pose significant threats to Maine agriculture, the environment and human health. The proposed Clinic will have the potential to avert many agricultural, forestry, public health, and structural pest damage scenarios. The new facility will provide the University of Maine Cooperative Extension IPM Program with the capability to deal with a greater variety of pests, both through detection and research, in a safe biosecure lab. The proposed facility will also enhance the University of Maine's ability to have a positive impact on economic objectives by giving Maine's citizens and businesses access to a resource that helps them solve plant and home pest problems so that they can continue to thrive and compete in the marketplace.

Please review your submission carefully.

The Notice of Intent must be filed electronically with MTI no later than noon, Tuesday, May 4, 2010. Late submissions will not be accepted.

Send this Notice of Intent to Apply to the Maine Technology Asset Fund by clicking the Submit button directly below. Your proposal is not submitted until you click the submit icon.

Upon MTI's receipt of the electronically submitted Notice of Intent, you will receive an automatically generated acknowledgement of the receipt. An e-mail acknowledgment will also be sent to the Project Director.

In addition, within two business days MTI will send an e-mail to the Project Director providing an application number to be included on each page of the formal application, and an acknowledgement that the Notice of Intent is complete.

Submission Metadata

IP	127.0.0.1
Browser	Mozilla/4.0 (compatible; MSIE 7.0; Windows NT 5.1; .NET CLR 1.1.4322; InfoPath.2)