Overview - 2021 Barrett Sustainable Food Engineering Grants

Background:

The Barrett Family Foundation has donated $1.5M to create a research fund called “The Barrett Family Research Fund for Sustainable Food Engineering”. These funds will be used to support research projects in engineering at the University of Guelph which focus on i) Sustainable food packaging; ii) Advanced food manufacturing; and iii) Green technology for the food industry.

Vision:

To support the creation of more world-class sustainable food technologies which address current and future industry challenges and promote further innovation in the Canadian food industry.

Guiding Principles

Projects supported by Barrett Family Research Funds shall:

- Promote diversity of thought,
- Build research capacity at U of Guelph in the identified themes with a priority placed on funding projects in the field of Sustainable Food Packaging
- Fulfill the Barrett Family vision of creating a new standard of best practices and leadership in the sustainable food manufacturing sector.

Annual Funding Envelop:

- Approximately $250,000 is available for allocation this cohort of projects.
- Projects may start spending grant funds no sooner than 3 May 2021

Project Grant Summary:

- Up to $50,000 per project
- One-year in duration (start May 2021 – end May 2022)
- Project duration extensions may be approved with suitable justification
- Approximately five projects will be awarded
- No overhead expenses deducted
- Progress report required after 6 months and a final report upon completion
- Required attendance at the Barrett Design Day (spring event) to share results
- Must involve at least one faculty from School of Engineering
- Must involve more than one faculty from the University of Guelph or other institution
- Industry partner support and involvement preferred but not required
- Projects developing/using *Sustainable Food Packaging* are most preferred.
- Early career faculty are preferentially encouraged to apply to build capacity in sustainable packaging

Key Goals:

- Improve the productivity, quality and competitiveness of the food industry
- Create valuable capacity at the U of Guelph in sustainable food packaging and sustainable food engineering processes
- Train and enable students to become the future leaders of a sustainable food industry, and
- Increase the University of Guelph's role in helping food industry partners adopt innovative and sustainable technologies.

Eligibility Criteria:

- Each project submission must have a current University of Guelph, School of Engineering Faculty member included on the team and involved in a meaningful role.
- Faculty will be limited to one (1) application as the Principal Investigator (PI).
- Each project must have at least one other researcher from another U of G department or other external institution or industry.
- Industry partners are an asset and ideally partners will be willing to participate in the project in a meaningful way to add value in the research process.
- Grants will be awarded on merit as outlined in the evaluation criteria listed below.

Requirements:

- Successful applicants must agree to prepare and submit a mid-year progress report as well as a final project report which will be used to inform the Barrett Family Foundation on both progress and results.
- Teams are expected to maximize the use of U of Guelph resources available both in and beyond the School of Engineering.
- Successful applicants and associated graduate students must agree to attend and meet with the donors during an annual outreach event entitled, "The Barrett Research Day."
- Grant funds must be utilized according to the projected budget, within approved grant duration, unless otherwise approved the CEPS Administrators.
- Projects must support Equality, Diversity and Inclusivity of all participants.
- The project must support one or more of the targeted Themes (see below).

Themes:

1. ***Sustainable food packaging***: The four basic functions of food packaging are protection, communication, convenience, and containment. Suitable projects will explore the application of new technologies, testing new materials and processes to increase the effectiveness of these functions in a sustainable way, while adding novel or enhanced features. <u>This theme is a priority and most preferred!</u>

2. **Advanced food manufacturing technology**: The incorporation of machine learning, robotics, systems optimization, and new technology development in advanced food manufacturing to establish “smarter” and more efficient processes for the food industry.

3. **Green technology in the food industry:** The use and development of technologies to enhance the efficiency, reduce energy usage or lower operating costs and the carbon footprint in food industry.

Application Schedule:

Open call for applications:	mid October 2020
Townhall meeting:	early November 2020
Applications due:	15 December 2020 – noon
Adjudication & project review:	January 2021
Approved projects announced:	early February 2021
Funds available for project use:	3 May 2021

Appendix
Technology Readiness Level (TRL) Scale

Technology Readiness Level	Description *Source: Based on the NASA TRL system.*
TRL 1 Basic principles observed and reported	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development (R&D). Examples might include paper studies of a technology's basic properties.
TRL 2 Technology concept and/or application formulated	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative, and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.
TRL 3 Analytical and experimental critical function and/or characteristic proof of concept	Active R&D is initiated. This includes analytical studies and laboratory studies to physically validate that the analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
TRL 4 Component and/or breadboard validation in laboratory environment	Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared with the eventual system. Examples include integration of "ad hoc" hardware in the laboratory.
TRL 5 Component and/or breadboard validation in relevant environment	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements, so they can be tested in a simulated environment. Examples include "high-fidelity" laboratory integration of components.
TRL 6 System/subsystem model or prototype demonstration in a relevant environment	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity laboratory environment or in a simulated operational environment.
TRL 7 System prototype demonstration in an operational environment.	Prototype near or at planned operational system. Represents a major step up from TRL 6 by requiring demonstration of an actual system prototype in an operational environment (e.g., in an aircraft, in a vehicle, or in space).
TRL 8 Actual system completed and qualified through test and demonstration.	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation (DT&E) of the system in its intended system to determine if it meets design specifications.
TRL 9 Actual system proven through successful mission operations.	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation (OT&E). Examples include testing the system under operational mission conditions.