******2021 Barrett Sustainable Food Engineering Fund**

**Proof of Concept – Grant Application**

**Grant Summary**

* One-year in duration (start May 2021 – end May 2022)
* Up to $50,000 per project
* 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 the 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 so you can build capacity in the field of sustainable packaging

**Project Evaluation Criteria**

Project proposals will be scored on the merit of supporting the following factors:

1. Understanding of the industry problem that needs to be solved (Who cares?) 10
2. Understanding of the competitive landscape/opportunity (Competing techs?) 10
3. Degree of involvement of industry partners (What is industry’s role?) 10
4. Business opportunity for industry (What are the projected economic benefits of

the technology) 10

1. Awareness of the barriers that could limit industry from adopting new

technology (Will industry use it?) 5

1. Quality of student training (How are you developing business leaders?) 10
2. Opportunity to build capacity and expertise in Sustainable Food Packaging 10

at the University of Guelph

1. Quality and clarity of the detailed project plan and probability of success 10
2. Cost-Benefit ratio (Justify the budget for the expected research output) 5
3. Degree of advancement of the technology (How does it improve the Technology Readiness Level - TRL) 5
4. Probability of creating new, innovative, and useful Intellectual Property 5
5. Probability of industry adoption at the end of the project (Market impact) 5
6. Overall clarity and professionalism of the written proposal, especially as

articulated in the Executive Summary 5

Total 100

**Project Background**

**Title of the Project (public, max 25 words**):

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**Expected Project Start Date**

* no sooner than 3 May 2021 (dd-mm-yyyy):

**Expected Project Completion Date**

* no later than 1 September 2022 (dd-mm-yyyy):

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**Principal Investigator**:

**Department and College**:

**Email**: **Phone**:

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**Additional Investigator:**

**Department and College:**

**Email: Phone:**

**Additional Members of the Project Team**: **Position and Role:**

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**Industry Collaborator:**

**Address**:

**Industry Contact**:

**Email**: **Phone**:

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**Barrett Grant Funds Requested: $**

**Industry Funds Fully Secured: $**

**Industry In-Kind Value Secured: $**

**Total Estimated Project Value: $**

**What is the main purpose of the project? (choose only one)**

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1. Discovery research – finding novel concepts and solutions
2. Practical proof of novel concepts recently discovered
3. Applied research on known concepts
4. Optimization/improvement of known applied research
5. Creation of prototypes to demonstrate applications to industry
6. De-risking and debugging existing technologies
7. Other – explain:

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| Other: |

**How many Highly Qualified Personnel (HQP) will be involved in the project?**

Definition: HQPs arestudents (including Summer, Masters, PhD and Post-Doctoral Fellows) provided scientific learning, advanced skills training and personal leadership development. One HQP is a student that contributes a minimum of 20 hours per week for 16 weeks to the Project.

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| **Number** | **Role** |
|  | Post-Doctorate Fellows |
|  | PhD or DVSc Students |
|  | Master Students |
|  | Summer Students |

**List the industry sector(s) most likely to benefit from your project**:

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**List previous sources of funding and obligations:**

List any previous funding used to develop the Technology to its current level. Do you, your team or the University of Guelph have any obligation to these previous funders as it relates to the future development and use of the Technology in this proposal?

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**Previous support from the Ontario Agri-food Innovation Alliance:**

Has this Technology received any support at any time through its development to date from the OMAFRA- UofG Partnership or Ontario Agri-food Innovation Alliance such as their Research Program, KTT Program, POP Fund, or use of Research Stations (like Arkell, Elora, Alma, Ridgetown, Simcoe etc.)? If yes, list previous project title and project number.

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**Barrett 2021 Sustainable Food Engineering Grant**

**Project Proposal**

**Please answer the following questions using 11-point font within the maximum word count.**

**Proposal Title (Max 25 words)**

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**Q1. Executive Summary: (Max 200 words i.e. one page) Clearly and briefly describe:**

* the problem your team plans to solve
* who cares about having this problem solved?
* your proposed or hypothetical solution
* the predicted impact this solution will have on industry
* how you plan to develop a solution at what cost and schedule
* the follow-on next steps that need to happen after the project is completed to ensure the solution is put into practice by industry.

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**Q2. What is the Problem you are attempting to solve? (Max 100 words)** Clearly but briefly, describe what customer pains (problem, obstacles) your technology will reduce or what customer gains (financial, time or physical) you expect your technology to deliver to industry and/or consumers. Provide data, examples or references to support your belief that industry is very motivated to solve this problem. Why does or why should industry care about your Technology (i.e. solution)?

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**Q3. Describe your Technology or proposed solution and the specific features that make it novel or innovative? (Max 100 words)**

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**Q4. What, if any, solutions currently exist in the market or industry, how are they different and how are they inferior or superior to your Technology? (Max 100 words)**

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**Q5. Describe the end user of your Technology? What are the most important factors they care about, want to see and are willing to pay for in your new Technology or solution? (Max 100 words)**

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**Q6. What are the anticipated economic benefits, if your technology is adopted? (Max 100 words)** Clearly but briefly describe your understanding of the market that your Technology will enter and list reasonable tangible outcomes/benefits for Canadian industry. (i.e. job creation, increased profit, export opportunities, decreased CDN production costs, etc.)

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**Q7. Describe how this project will help you build capacity at the University of Guelph in the field of Sustainable Food Packaging. If not supporting Sustainable Food Packaging, then explain how you are building capacity in another theme. (Max 200 words).** Also, please attach a CV (PDF) of the Principal Investigator for reference.

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**Q8. Describe all industry partners who have agreed to collaborate with your team in terms of revenue, staff size, geographical area of business, and how or what your partner plans to contribute to the project? (Max 100 words)**

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**Q9. What is the current Technology Readiness Level (TRL) of your Technology (see appendix for a list of TRL)? How far do you expect to advance the TRL, once the project is completed?**

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**Q10. List any evidence that will substantiate the current TRL of your Technology? (Max 50 words)**

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**Q11. List and briefly explain the key factors that will affect the probability that Industry will eventually adopt your Technology. (Max 100 words).** Assuming your team can complete the project successfully, briefly list (point form preferred) the next steps that must occur before your technology can be adopted by industry. Provide an anticipated timeline if possible.

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**Q12. Does your Technology currently have any protectable intellectual property (IP), if so explain? Will this project generate new IP, if so explain? Does competitive IP exist that will reduce your Freedom to Operate and use your Technology, if so explain. (Max 50 words)**

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**Q13. Training HQP: Describe the scientific, leadership and business training you plan to deliver to your HQP(s) during this project? (Max 100 words)**

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**Project Plan:**

**Q14. List the 3 most important milestones required to complete the project successfully.**

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| **Milestone**  **#** | **Description** | **Expected Completion Date (dd/mmm/yyyy)** |
| **1** |  |  |
| **2** |  |  |
| **3** |  |  |

**Q15. Describe the most important tangible outcomes you plan to deliver.** For example: reports for industry, academic publications, presentations to industry (public, private), proof of concept, proof of relevancy, creation of a working prototype, new patent application, formalized industry partnership, follow-on research funding, new products launched, new company formation, new jobs created by industry, graduate student hired by industry, etc. (Max 100 words)

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**Q16. Detailed Project Plan: Using point form, describe the important logical steps your team will follow to complete the project. If any steps are not obvious, provide a rationale for the method and plan used. (Max 500 words).** Note: Do not repeat what is written above. The plan should explain and justify your methodology. Plans that consist of a list of scientific materials will not be accepted. Be clear, brief, and realistic as you describe why this process is the preferred method to accomplish your project goals.

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**Budget**

**Q17. Complete the budget below. The overhead rate is zero 0%.**

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|  | **Description** | **Amount $** |
| **REVENUE** |  |  |
| Secured Industry Cash $ |  |  |
| Industry In-kind Value $ |  |  |
| Total Industry Contributions (Cash + In-kind) $ |  |  |
| Grant Amount Requested |  |  |
| Total Project Value |  |  |
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| **EXPENSES** |  |  |
| **OMAFRA**  **Research Station Fees** |  |  |
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| **Salaries & Stipends** |  |  |
| Grad Students |  |  |
| Post Doctoral Fellows |  |  |
| Contract Technicians |  |  |
| Summer Students |  |  |
| Other (explain) |  |  |
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| **Travel Costs** |  |  |
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| **Operating Costs** |  |  |
| Materials/Supplies |  |  |
| Computing |  |  |
| Knowledge mobilization & technology transfer expenses |  |  |
| Administrative and project management |  |  |
| Other operating expenses  (explain): |  |  |
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| **Equipment (items < $5K)** |  |  |
| Tools and equipment |  |  |
| Lease/rentals |  |  |
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| **Other (explain):** |  |  |
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| **Explanation of Budget Items:** | | |
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| **Secured Industry Partner Support:** Describe any fully committed and secured in-kind support from an Industry Partner and why it adds value to the Project. | | |
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**Declaration, Award, and Department**

**Instructions:** The Principal Investigator and Additional Investigator are required to read and accept the following terms and conditions before submitting a proposal.

By submitting the attached proposal, we are accepting the following terms:

1. We are authorized to act on behalf of the other research team members that are named in this proposal and the organization to which they are affiliated in order to apply and submit this project proposal. The involvement and roles of all research team members in this proposal has been discussed and agreed upon on by them.
2. We understand that even if an application meets the specified criteria, there is no guarantee that funding will be awarded as there may be other projects that more effectively meet the program's objectives. If the project is subsequently approved for funding the applicant will be notified in writing.
3. We are responsible for the contents of this proposal and any related information provided. Any certification, consent, agreement or similar document submitted electronically is binding to the same extent and effect as if in writing accompanied by our signature.
4. My name and the name of the additional investigator, the proposal title and the executive summary may be shared with third parties for the purpose of finding expert (peer) reviewers who do not have a conflict of interest with the proposal. Additionally, the Office of Research may show the entire proposal to third parties (i.e., review committee members) for the purpose of obtaining their opinions on its merits and selection for funding approval. When applicable, such third parties are required to sign a Non-disclosure Agreement and must declare they have no Conflict of Interest before they have access to the full proposal or other UofG confidential information.
5. We are not aware that this proposed project does or will infringe on any third party protected intellectual property (IP) or technologies.
6. We understand that should our proposal be funded, general information about the proposal will be posted on the Office of Research web site. As well, the entire proposal may be shared with University of Guelph administrators at the Office of Research, Research Innovation Office, and School of Engineering.
7. We understand that should our proposal be funded, information about the proposal will enter the public domain. We will contact the Research Innovation Office should any information in the proposal be considered sensitive, confidential or proprietary and need to be removed from any public disclosure of the proposal by the University of Guelph or external funding agencies.
8. Freedom of Information and Protection of Privacy Act: We the applicants acknowledge that the Office of Research is bound by the Freedom of Information and Protection of Privacy Act (Ontario), as amended from time to time, and that any information provided to the Office of Research in connection with this application, the proposed project, and any agreement that may be entered into with the University of Guelph, is subject to disclosure in accordance with that Act or pursuant to an order of a court or tribunal or a legal proceeding.
9. Notice of Collection of Personal Information: We understand that any personal information on this form, such as information regarding the education and employment history of the principal investigator, additional investigator and research team members, is necessary to assist in assessing the qualifications of a proposal for funding. Where any personal information related to team members is submitted, the applicant acknowledges that he/she has obtained the consent of these individuals to submit the information for the purposes of the evaluation of the application for funding. The applicant will provide evidence of consent from these individuals to the Office of Research, if requested.

**Signed and Agreed by**:

This document may be signed by electronic signature or stamp, or sign with wet signature and scanned, OR by typing your name and employee number below. Either method will be considered providing consent and having signed this document

**Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Principal Investigator: Date:

Department:

Employee number:

**Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Additional Investigator: Date:

Department:

Employee number:

**Supporting Documentation - Checklist**

All documents must be in PDF format.

**Required:**

* Completed application form (saved as a PDF) – answering all questions clearly within word limits
* OR-5 Form signed by the PIs Chair and Dean:

(No signature needed for the Office of Research – this will be obtained if your Project is approved. The OR-5 may require applicable Animal Use Protocol, Human Ethics, Biological Use, Radiation Use approval numbers and documentation.)

* Brief CV attached (PDF) describing the Principal Investigator
* Any Letter of Commitment securing financial or in-kind support from an industry partner which must include any conditions/restrictions related to their support.

**Optional:**

* Letters of Support or Recommendation from a relevant industry partner without any financial or in-kind commitment
* Any other documents you deem important and are directly referenced in the proposal such as: research commitments, proof of leveraged funding from other grants/commitments, citations to articles demonstrating industry needs or the state of development of your Technology.

**\*\*\* EMAIL your completed application in PDF form: \*\*\***

TO: Kelly Ziegler [kziegler@uoguelph.ca](mailto:kziegler@uoguelph.ca)

COPY: David Hobson [dhobson@uoguelph.ca](mailto:dhobson@uoguelph.ca)

| **Appendix – Technology Readiness Level (TRL) Scale** | | |
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| **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. |