Program Guide

Artificial Intelligence Program

Updated February 2024

Protein
Industries
Canada
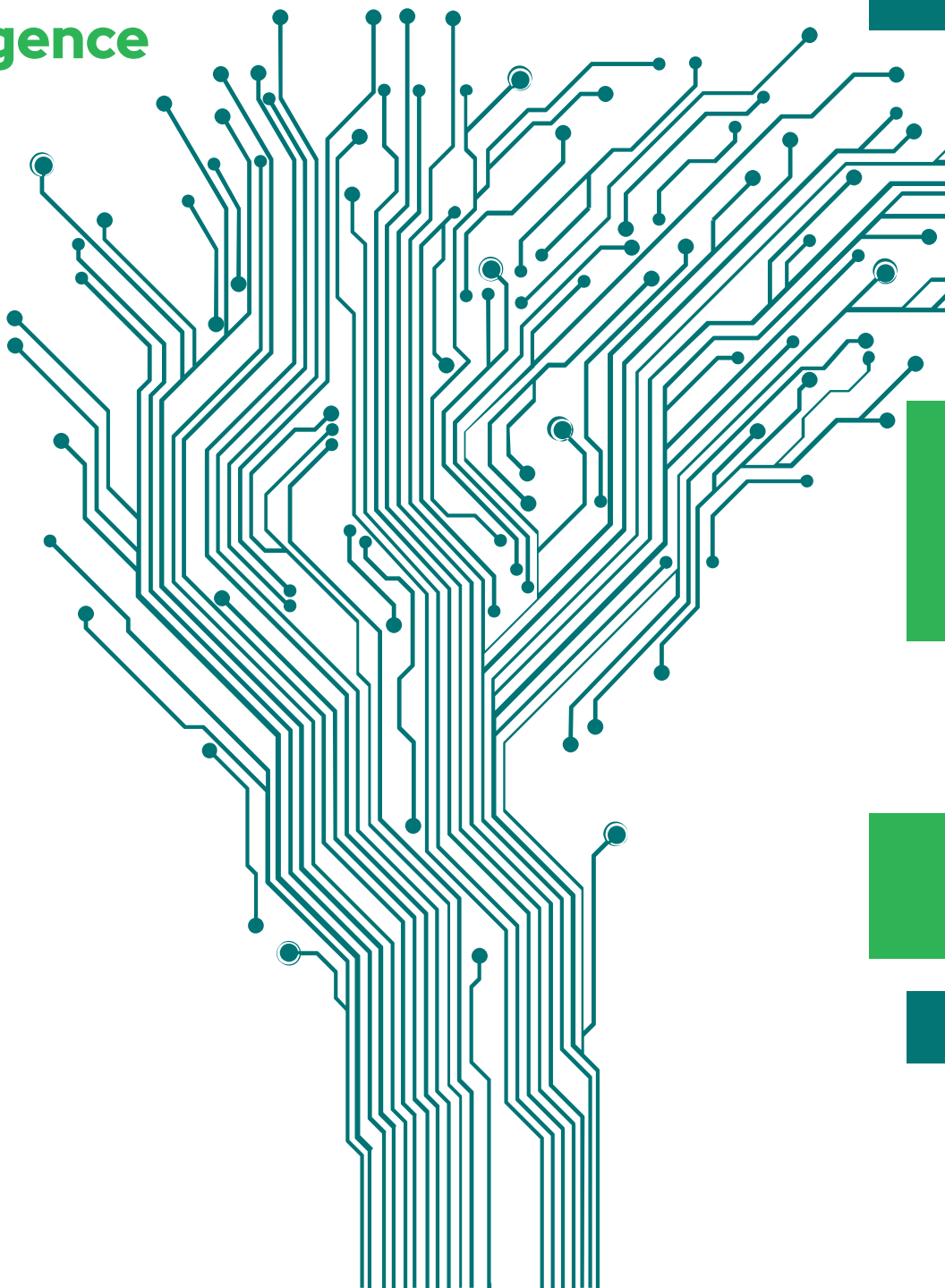
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Introduction to the Artificial Intelligence Program

About Protein Industries Canada

Protein Industries Canada is an industry-led, not-for-profit, value-chain organization created to position Canada as a global source of high-quality plant protein and plant-based co-products. Protein Industries Canada will build on Canada's strengths to substantially increase global market share in novel protein and co-product fractions, ingredients, food and feed products, and technologies, contributing to Canada's economic growth and international trade balance. This will occur through mobilization and enhancement of Canada's agrifood innovation capacity in support of industry-driven market priorities and needs.

Our vision is to position Canada as a leading global source of sustainable, high-quality plant protein and plant-based co-products, while substantially contributing to Canada's economic growth and international trade.

Our mission is to inspire innovation and support collaboration to transform Canada's agriculture and food processing sectors. Protein Industries Canada has a track record of working collaboratively with stakeholders to accelerate and commercialize transformative innovations in Canada's plant-based food, feed, and ingredient ecosystem. Since 2019 Protein Industries Canada has:

- Funded 53 projects for a total project value of more than $485 M.
- Leveraged $310 M in investment through industry partners.
- $264 M in follow-on investment in member companies.
- 230 new Intellectual Property Assets anticipated
- $15 B in Canadian GDP impact in 10 years and 10,800 direct and indirect jobs expected, based on 28 analyzed projects.

ACCELERATING THE FUTURE

$15B*
CANADIAN GDP IMPACT IN NEXT 10 YEARS

660
NEW PRODUCTS AND SERVICES

53
TECHNOLOGY AND CAPACITY BUILDING PROJECTS

$485M
PROJECT VALUE

10,000*
DIRECT AND INDIRECT JOBS

$310M
LEVERAGED INVESTMENT THROUGH INDUSTRY PARTNERS

*from 25 analyzed projects

About the Pan-Canadian Artificial Intelligence Strategy (PCAIS) – Commercialization Stream

The Government of Canada has allocated funding in the Pan-Canadian Artificial Intelligence Strategy to leverage the Global Innovation Clusters' existing program architecture, collaborative network and experience supporting inclusive innovation to advance the commercialization of AI applications in Canada.

Between now and March 31, 2026, Protein Industries Canada will be investing $30 million into AI science that will benefit the plant-based and agrifood sector. The amount the Cluster invests in each project will depend on proposed scope and impact.

Objectives

The purpose of the PCAIS Commercialization Stream is to accelerate the translation of AI science and research into commercial innovations that generate economic and social benefits for Canadians.

Specifically, the PCAIS Commercialization Stream will make investments to build AI commercialization through Canada's Global Innovation Clusters by:

- Building a shared competitive advantage for the Cluster, including positioning it as a world-leading innovation ecosystem;
- Advancing a range of business-led innovation, technology and capacity-building leadership activities that will boost performance and Canada's competitiveness in areas of economic strength;
- Generating new products, processes and services and positioning firms to scale, integrate into global value chains and become global market leaders; and
- Fostering a critical mass of growth-oriented firms, and strengthening connections and collaborations between private, public and academic leaders pursuing private-sector-led innovation and commercial opportunities.

COLLABORATION ACCELERATES INNOVATION

Opportunities in AI

Three main themes were identified in which applications of AI would have the greatest return to the plant-based and agrifood sector, as we as drive outcomes on _The Road to 25 Billion_:
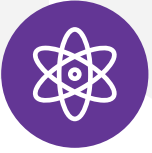
Accelerated Innovation – Focused efforts at critical points of the value chain to fast-track variety development and product formulation will help Canadian firms iterate new products faster and at lower manufacturing costs. This will help create products that are aligned with market expectations of plant-based foods that bring the same taste, texture and experience as traditional proteins.

Process Optimization – The ability to grow an adequate amount of feedstock and process enough ingredients is key to the competitiveness of Canada's plant-based food, feed and ingredient sector. The application of AI to improve primary production, reduce waste and streamline processing efficiency will help ensure both happens, while also improving the sustainability of Canadian products.

Social Impact – The key to reaching $25 billion in annual sales of plant-based foods is the ability to deliver on consumer demands. There is an opportunity to apply AI to better understand consumer demands, specifically around Environmental, Social and Governance (ESG) factors and nutrition, then using this to drive product development and the commercialization of new products aligned with market expectations, while also contributing to the health of Canadians and our environment.

Eligible Activities

The list of eligible activities for the AI Commercialization Stream includes:

Technology leadership – Activities in this area include advancing platform technologies central to future competitiveness and building a technology advantage for the Global Innovation Cluster, demonstrating Canada's global leadership. Activities in this area may include collaborative technology leadership projects that enhance the productivity, performance and competitiveness of members (such as collaborative R&D projects), demonstration or prototype development projects with benefits for multiple firms, development of production methods and processes involving industry and academic partners, or private-sector-led commercialization projects.

Partnerships for scale – Activities in this area include projects that serve a target group of members to support their growth, including increased domestic demand for Global Innovation Cluster products and services or by facilitating expansion. Activities in this area may include linking start-ups with strategic partners, offering business mentoring, consulting and coaching, supply chain development or integration efforts for Global Innovation Cluster SMEs with local anchor firms, and working with public entities that provide access to capital and financing.

Diverse and skilled talent pools – Activities in this area include projects that involve industry in the enhancement of regional labour force skills and capabilities, or address industry talent needs. Examples of projects may include a recruitment campaign to repatriate Canadian talent to the Global Innovation Cluster, development of curricula linked to industry's needs and workforce integration programs for students, development and promotion of specialized certifications in areas of technology leadership, retraining programs for existing workforce, assessment of industry's workforce current or anticipated needs, and building awareness of industry demand for skilled talent across stakeholder groups.

Access to innovation – Activities in this area include projects that provide a benefit to a range of members through investments in assets, services or resources. Activities in this area may include support for access to specialized technical services, advancement in farm-to-food technologies, installation of and access to dedicated laboratory or cutting-edge equipment, and acquisition and assertion of jointly held intellectual property.

Global advantage – Activities in this area include projects that position the Global Innovation Cluster as world-leading in its field, enabling firms to seize market opportunities and attract international investments and partnerships. Activities in this area may include Global Innovation Cluster promotion, investment attraction to the general region of the Global Innovation Cluster, studies to identify new global markets for Global Innovation Cluster products and services, participation in or leadership of trade missions to key markets, development of regulatory or policy proposals to enhance technological advantage, and the development and promotion of new international standards that incorporate the Canadian approach.

Guiding Principles for AI projects

The Government of Canada has a set of guiding principles on the responsible use of AI. To ensure the effective and ethical use of AI the government will:

1. Understand and measure the impact of using AI by developing and sharing tools and approaches.

2. Be transparent about how and when we are using AI, starting with a clear user need and public benefit.

3. Provide meaningful explanations about AI decision making, while also offering opportunities to review results and challenge these decisions.

4. Be as open as they can by sharing source code, training data and other relevant information, all while protecting personal information, system integration, and national security and defence.

5. Provide sufficient training so that the government employees developing and using AI solutions have the responsible design, function and implementation skills needed to make AI-based public services better.

More information on these guiding principles may be found on the Government of Canada's "Responsible use of artificial intelligence" webpage.

Program Streams

Protein Industries Canada will organize the delivery of AI commercialization support around three distinct streams: Projects, Systems and Community/Capacity Building. These streams were developed in consultation with stakeholders, ensuring they meet the business goals of individual companies, address larger opportunities within Canada's plant-based food, feed and ingredient sector, ensure alignment with the recommended actions in *The Road to $25 Billion*, and ensure that the benefits of AI technologies accrue to all members of society.

Project Stream

The Project Stream is designed to help individual companies within the plant-based food, feed and ingredient ecosystem incorporate AI as a core business function. This will require collaboration with one or more entities within the AI ecosystem. The Ecosystem Connectors (non-profits, incubators and accelerators that support the growth and scaling of companies) would drive the partnerships based on the business problem statement.

An example of a project within the Project Stream is a food manufacturer that wants to employ AI in the form of imaging technology and process automation for food safety and/or quality assurance. Here there is a clear business need for one organization to use AI to improve processing efficiency, reduce labour costs and improve food safety.

System Stream

The System Steam will focus on overall sector competitiveness and will require multiple partners from the plant-based food, feed and ingredient ecosystem to collaborate on a common goal that benefits the members of the consortia and the entire sector.

An example of a project in the System Stream is a consortium of plant-based food companies that are looking to iterate new products faster and improve consumer acceptance. By working within a data trust and pooling information related to the functionality, nutrition and chemical property of ingredients, we can envision a system whereby companies are creating and testing product formulations in a virtual world. This could include ingredients being analysed for nutritional composition, allergenicity, taste and texture, and even the co-innovation of products based on ingredients available from different members of the system.

Community and Capacity Building Stream

Community and Capacity Building Stream projects will help ensure that benefits of AI application in the plant-based food space are achieving societal benefits. This stream will focus on the nexus between plant-based foods and human health, as well as between plant-based foods and environmental health.

An example of a project in the Community Stream could be a collaboration between national health advocacy agencies along with a number of plant-based food companies to use AI to design food products that help achieve certain health outcomes or to address health concerns. We could also envision a system that builds upon our current investments to develop chain-of-custody systems to help reduce food waste and improve food security in rural and remote northern communities.

Turning Ideas into Projects

Protein Industries Canada will co-invest in collaborative consortia that leverage strengths, address gaps, and incent innovations along the agri-food value chain. All projects are expected to engage diverse and inclusive teams with meaningful participation of women, Indigenous Peoples and/or other under-represented groups.

Protein Industries Canada's contribution, both in magnitude and proportion, to an approved project will be determined by how, and the extent to which the project outcomes are aligned with the priority areas and Global Innovation Cluster themes and the potential for transformation.

Protein Industries Canada staff are available to support project consortia throughout the proposal development process.

Our vision is to position Canada as a leading global source of sustainable, high-quality plant protein and plant-based co-products, while substantially contributing to Canada's economic growth and international trade.

Eligibility

For a project to be considered eligible for investment, it must:

1. Be submitted by a consortium of at minimum two (2) Protein Industries Canada members, at least one of which is a Small or Medium Enterprise (SME) as defined by Statistics Canada as a business with 499 or fewer employees. Alternative consortia structure may be permissible for Community and Capacity Building Stream Projects, at the discretion of Protein Industries Canada.

2. A consortium may include academic or research institution(s). This is not mandatory but is encouraged.

3. Each member of the consortium must contribute to the project in a meaningful way. This is generally through a financial commitment and activities in the workplan, but could also be providing Intellectual Property or market expertise etc.

4. At least two members of the consortium must contribute financially to the project[1]. Protein Industries Canada will reimburse up to 45 per cent[2] of eligible costs of approved Project Stream and System Stream Projects.
   - It will be up to the consortium members to determine the amount and nature of their respective contributions. The contribution of each consortium member does not need to be equal.

5. At least two partners must be Canadian companies or multi-national corporations who are legally entitled to do business in Canada with a significant Canadian business operation. Non-Canadian entities can participate in a consortium, based on approval by Protein Industries Canada.

6. The project must be aligned with the objectives of Protein Industries Canada and the Global Innovation Cluster initiative.

7. All Projects are required to pay a project administration fee to Protein Industries Canada. This fee will be four per cent (4%) of the total eligible reconciled project cost. Project administration fees are not applied to Community and Capacity Building Stream projects.

8. The initiative must be incremental to the regular business of the participating organizations, meaning that the project:
   - Is not approved nor in progress and that financial commitments to it are distinct from investments that would have otherwise occurred;
   - Would not be possible without the participation of consortium partners;
   - Is new or would not be undertaken at the same scope or scale without the co-investment provided by the Cluster.

9. At least one consortium member in Project Stream and System Stream projects must represent a target customer or user of the new technology solution.

10. All Project Stream and System Stream projects must have experienced and proven project management capabilities for complex, multi-party collaborative initiatives.

11. All projects must have at least one partner with demonstrable experience deploying AI technology.

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1   Financial contributions from a single member may be permissible for Community and Capacity Building Stream projects.

2   Reimbursement rates for Community and Capacity Building projects will be determined on a case by case basis.

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12. All Ultimate Recipients must be compliant with all economic or financial sanctions or trade embargoes imposed, administered or enforced from time to time by the Government of Canada.

13. The project cannot be a "designated project" or a "project" under the applicable federal environmental and impact assessment legislation.

The purpose of the PCAIS Commercialization Stream is to accelerate the translation of AI science and research into commercial innovations that generate economic and social benefits for Canadians.

Points to consider when you are building an eligible project under this program:

Problem Scoping/Business Goal Determination	How does the scope align with the program's priority areas and Global Innovation Cluster themes? How is this work incremental to your existing business? Do you have an understanding of market size and the competitive landscape? Does the consortium have the skills necessary to support development and commercialization?
Consortium Building & AI Ecosystem Matchmaking	Who is in the consortium (eg. agrifood industry partners, AI ecosystem members, technology providers, other AI ecosystem builders) and what are each of their roles? How do the consortium members benefit? Is the end user of the technology represented in the consortium?
Projects, AI and Data Assessments	Are you able to provide quantitative and qualitative information on: • Data & data governance strategy • AI impact assessments • Project impact assessments
Intellectual Property	How strong is the consortium members' IP and what is the strategy to maintain a competitive advantage? A detailed IP Rationale must be included in every application[1].
Data & Data Governance Strategy	A data and data governance strategy will be required for all project applications. As general guidance when formulating a data governance strategy, consider these broad categories: 1. What are the foundational elements of your data and data governance strategy? 2. How are you collecting, organizing and grading data? 3. How are you enabling data access, and sharing and managing data retention? 4. What are your plans for data analytics, AI solutions and commercialization of your AI product? 5. What organizational changes are needed to support your data and data governance strategy?
Commercialization and Scaling Plan	What are the economic, environmental and social benefits to Canadians? Does your business plan support market entry and commercialization? What is the value proposition that will drive commercialization? Do you have sufficient capital to support commercialization or what is your plan to access capital?

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1   Community and Capacity Building Stream projects may not require an IP Rationale, at the discretion of Protein Industries Canada.

Project Budget

There is no set maximum that a project can receive, although Protein Industries Canada will only reimburse up to 45 per cent of reconciled eligible costs in Project Stream and System Stream projects. Projects can be submitted as multi-year projects, with the expected annual expenses broken down by year in the proposed budget.

The Application Process

The application process is made up of two parts:

Expression of Interest (EOI) ➡ **Full Project Proposal**

Protein Industries Canada has staff to help guide you throughout the Project Application Process. We will work in-step with consortia through the project application process. This includes helping you understand if your project is eligible, identifying other potential partners you may want to work with, supporting development of the EOI, working through IP, data and commercialization strategies, and more. Our job is to help projects be successful.

Step 1: The Expression of Interest (EOI)

Once you have reviewed the Project Eligibility Requirements, email projects@proteinsupercluster.ca to set up an introductory call. Following the call, prospective applicants will be provided with the Expression of Interest (EOI). Each project should submit a single EOI and consortia members must work together.

Each consortium member will also need to fill out and sign a "Declaration As To Authorization and Compliance". This document outlines each partner's compliance with the Government of Canada's sanctions and applicable Acts, and must be complete before moving forward to the second step in our application process.

Once you've completed your EOI and Declaration forms, please submit them by emailing projects@proteinsupercluster.ca.

Step 2: The Project Proposal

Evaluation of EOIs may result in one of three outcomes:

1. The consortium may be invited to proceed to a Full Project Proposal;
2. The consortium may be invited to proceed to full proposal following satisfactory completion of a Data and AI Readiness Assessment;
3. The EOI may be tabled for additional information[1]; or
4. The EOI may be declined.

Protein Industries Canada may require consortia to complete a Data and AI Readiness Assessment for their proposed project. Completion of this program may be cost-shared with Protein Industries Canada following the Artificial Intelligence Program reimbursement model.

Data and AI Readiness Assessments will require that consortia work with an AI service provider to define and evaluate aspects of their project. Topics addressed in the assessment may include:

- Evaluating data availability, quality, and quantity;
- Identifying the organizational resources and processes in place to support adoption of an AI solution;
- Articulating the product strategy that supports the use case for AI to tackle the defined business problem; and
- Defining project risks and mitigation strategies to ensure solution longevity following completion of the project.

Once an EOI has been approved, it moves to a full Project Proposal. Successful applicants will be notified by email and will be invited to attend a Proposal Orientation meeting held via conference call. Project Proposal development will be collaborative between Consortia Members and Protein Industries Canada staff, and Protein Industries Canada will monitor progress regularly.

Projects will be evaluated as they are submitted.

The Project Proposal may be submitted via email to projects@proteinsupercluster.ca.

Proposals will be prepared using the provided Word and Excel templates. The Word template will not exceed 40 pages. Both parts of the application must be completed for a project to be evaluated. The proposal will provide information in greater detail than the EOI.

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1   Requests for additional information may be related to project scope, workplan or other details, or to specific consortium members (ex: corporate information, financial assessments, etc).

Intellectual Property and Data Governance

Protein Industries Canada has always worked from the principle that IP is a strategic asset that enables organizations to meet their business objectives. Strategic protection of IP enables organizations to secure competitive advantages, and Protein Industries Canada works to ensure that foreground IP created with Cluster funding benefits Canada's agrifood industry and Canada as a whole.

PCAIS Project Stream and System Stream projects are required to document an IP rationale as part of their project proposal. The IP rationale template will be provided to consortium members as part of the project proposal document and will be excised from the proposal and submitted to Innovation, Science and Economic Development Canada (ISED) to meet Protein Industries Canada's IP reporting requirements.

Protein Industries Canada will require all Project Stream and System Stream project participants to report on the IP assets generated by their project, which may include patents, trade secrets, trademarks, copyright, data sets and other types of intangible assets. Report details are limited to non-commercially sensitive information and required to meet Protein Industries Canada's IP reporting requirements. Non-commercially sensitive aspects of foreground IP generated in the project will be described in Protein Industries Canada's IP Hub. The IP Hub is a member-accessible registry of technology being commercialized for the benefit of Canadians and can also be used by members to showcase non-project IP available for license or further collaborative development. Protein Industries Canada will provide consortium members with IP training that addresses best practices for navigating challenges and opportunities associated with AI-driven IP.

Project consortia will also be required to develop a data governance strategy for their project. Protein Industries Canada will work collaboratively with all consortium members to identify data sets required for execution of the project, and to define the rules of engagement for how project-related data will be sourced, processed, stored, shared and governed by the consortium.

Scoring of Project Proposals

Review of Project Proposals submitted to Protein Industries Canada will be initiated within six weeks of receipt. Protein Industries Canada will work to review the projects as quickly as possible within the evaluation process, taking the time necessary to complete our due diligence. All projects are evaluated by the Eligible Projects Selection Committee. Input from additional technical experts appropriate to the project may also be considered. Projects will be evaluated against criteria that align under three main areas: Ecosystem Development, Technical Merit and Commercial Application.

At no time prior to, during or following a project evaluation may a member of a consortium attempt to influence or have a conversation about their project with any member of the Project Selection Committee. Doing so may result in the project being disqualified. All members are expected to comply with the Code of Member Conduct and the Project Selection Committee-Applicant Interaction Policy.

Project Approval

Once your project is approved, Protein Industries Canada will work with the members of the consortia to sign a Master Project Agreement (MPA). The MPA is the legal framework for the execution of the project amongst the consortium and will include detailed statements of work, budgets, project plans, IP, data and key milestones.

Prior to signing the MPA, Protein Industries Canada will ask every member of the consortium for, at minimum, the last two years of accountant-prepared financial statements and their current organizational structure. Additional information may also be requested to substantiate the Project Proposal. Eligible cost reimbursement can begin once the MPA is signed.