NGen Next Generation Manufacturing Canada

Project Development Workshop

Dedicated towards the July 14th Deadline

Canada is an Advanced Manufacturing Nation

- NGen is the industry-led, not-for-profit organization that connects Canada's strengths.
  - Manufacturers
  - Technology providers
  - Government organizations
  - Research organizations
  - Academia

Canada is an Advanced Manufacturing Nation

Our Mission is to build world leading advanced manufacturing capabilities in Canada.

NGen measures success by the benefits it delivers to Canadians.

NGen aims to:

- Develop world-leading technological capabilities in advanced manufacturing
- Increase industry investment in innovation
- Enhance value creation and economic growth
- Connect and actively engage members of Canada's advanced manufacturing ecosystem
- Contribute to the development of a skilled advanced manufacturing workforce; and
- Improve the social well-being of Canadians

Canada is an Advanced Manufacturing Nation

NGen's goal is to add at least $13.5 billion and 13,500 new jobs to Canada's economy by 2030

Expected Outcomes:

- New domestic and international sales
- New jobs created
- New companies created
- New products, processes, and services
- New Intellectual property created

NGen Funding

- $747 million in purchase orders
- 75 New IP Opportunities
- 51 new products in development
- 36 products to fight COVID-19
- 64 new manufacturing processes
- 18 public sector partners involved
- 24 academic and research partners
- 6 new companies created
- 1,100 jobs directly supported by projects
- 12,000+ new jobs projected over ten years

Next Generation Manufacturing Canada

Funding Streams – Key Dates

NGen: Funding Streams

Funding for Small and Medium Enterprises only

Feasibility Studies	Cluster Building	Pilot Projects	Major Projects
Partnership of 2 or more SME's working to prove or demonstrate the technical or economic feasibility of an advanced manufacturing opportunity	Group of SMEs with geographical, industry or technical interests, collaborating to forming a mini-cluster to address shared challenges and opportunities for business growth	Partnership of 2 SME's working on a smaller scale advanced manufacturing project.	Partnership of at least 2 organizations with an advanced manufacturing project. Project must include 1 SME.
Funding at 50% of eligible costs			Funding at 44.4%
Total project size between $50 to $200k	Total project size up to $150k	Total project size between $100 to $500k	Total project size between $500k to $20m
400 words per question	400 words per question	600 words per question	900 words per question

Key Dates

Project intake deadlines:

- Feasibility Studies and Pilot Projects:
  - 16th June 2021,
  - 6th July 2021,
  - 5th August 2021
- Major project $500k - $8m
- 14th July 2021

Project workshop Major projects (14th July Deadline) - IP, Finance eligibility, Application Process

- Tuesday 15th June 2021 – 1pm EST

Project Scope

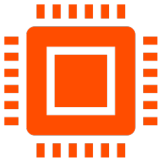
It's all about... Advanced Manufacturing

Digital Technologies

High fidelity modeling, simulation and analysis, machine learning and AI for manufacturing processes, blockchain, innovative new sensing techniques, advanced vision systems

Advanced Robotics

Autonomous robotics, proximity to or collaboration with humans, improved manipulation, manufacturing flexibility or precision



New Industrial Platform Technologies

Data Engineering and Analytics, development of 3D printing technologies, the creation of new groundbreaking processes

It's the Cutting Edge

Scope Criteria

Transformative

To involve the development of Advanced Manufacturing capabilities with the potential to confer a significant global competitive advantage to Canadian industry.

Collaborative

To develop industry relationships, including building trust and sharing in knowledge, risk, investment and the resulting benefits.

Projects must include at least 1 small and medium-sized enterprises (SMEs) and are encouraged to consider the inclusion of academic and research organizations.

Enduring

To leave a legacy in skills development, tools, testbeds, intellectual property, business knowledge for Canada's advanced manufacturing ecosystem beyond the partners and timeline of the project.

Applied Solutions Focused

To support later stage technology and manufacturing readiness with potential to generate significant long-term commercial and economic benefits, including jobs maintained and created.

It's all about... Making Canada a global leader

Projects Requirements

- All projects must demonstrate the development or application of an Advanced Manufacturing Technology or Process
- Projects must demonstrate that they are Collaborative, Transformative, Enduring and Applied
- All projects need to demonstrate meaningful collaboration with a minimum of three partners for projects over $8m and we will consider projects with just two partners if total costs are under $8 million
- At least one SME partner needs to be involved (applicants are strongly encouraged to include more SME partners and academic and research partners)
- Projects must deliver significant commercial benefits and jobs within the consortium and beyond

Projects Requirements

- The total cost of projects should be between $500K and $20M, although projects above that range may be considered if they demonstrate transformative potential and significant additional benefits to Canada's advanced manufacturing ecosystem.
- Note: For the 14th July 2021 deadline only project up to $8m will be considered.
- Capital expenditures over $1 million must be pre-approved by the Government of Canada
- No single partner may receive more than 70 percent of reimbursed funding
- Project partners cannot also be a sub-contractor or consultant within the project

Projects out of Scope

- Those related to experimental or theoretical work without any direct commercial application or use.
- Projects that develop products that are not used for Advanced Manufacturing
  - A small amount of product development is allowed as long as it contributes towards the advanced manufacturing goals - less than 5% funding allocated.
- Production activities themselves or activities that subsidize full scale production
- Activities where benefits accrue to a single firm or organization
- Activities that could be viewed as anti-competitive
- Capital investment for production or for purposes not related to the research being conducted
- Projects that would be undertaken at the same scale or scope and within the same timeframe without Supercluster funding
- Any routine or periodic changes made to existing products, production lines, manufacturing processes, services and other operations in progress, even if those changes may represent improvements

Unsure if you are in Scope?

Still unsure if you are in scope e-mail: project@ngen.ca

Questions and Answers

How to prepare a strong application...

Tips and general principles

- Read the Project guide and finance guide in detail. https://www.ngen.ca/funding
- Don't start by answering the questions. Have a partnership meeting with your collaborators and p**lan the project with your partners.**

Win Win Win

- Think about how you achieve the NGen program goals (advanced manufacturing, scope and NGen goals), your goals as the lead and your partners' goals.

- Build relationships with your partners: build trust; get to a first name basis.
  - What are the issues you are trying to solve? Talk about them!
  - The more you put in at this stage the more you will get out.
  - The project will be easier and more effective when it launches.

Tips and general principles

1. Collaborate 2.Brainstorm 3.Structure the project 4. Build the Business case

- Make sure you and your partners have buy-in from Senior Management and that you have the right people with influence on the project team.
- Get a strong project manager or someone who can lead the proposal and drive it to a successful conclusion.
- Sketch out the project scope, common objectives, high level deliverables, overall timelines.
- Brainstorm the project benefits and opportunities together as a consortium.
- Build the business case with your partners.
  - The business case, project plan and financials need to hang together with all your project partners.

Tips and general principles

- Follow the guide to help support the development of the proposal.
  - Everyone approaches proposal development differently.
  - As a suggestion start with answering Question 1 and 3 this will define the vision of the project and the highlight what is transformative in Advanced Manufacturing.
  - Want feedback at this stage on scope and fit. Contact NGen and request feedback project@Ngen.ca Don't email your proposal use the secure portal.

Tips and general principles

- You do not have to apply all the suggestions for each question. Use the ones that are most relevant to your project. Be as comprehensive as possible.

- Consider the amount of funding being requested and the impact the project can have on leaving a legacy for Advanced Manufacturing in Canada.

- Every project is unique - therefore please include any other pertinent information not covered in this guidance.

- **Answer the questions.**
  - This is not an exam. The assessors however are only able to assess what is written in the application. To the best of your ability, try to address the relevant guidance provided for each question.
  - Work with your partners to answer the questions and quantify all the benefits that might accrue for each partner.

Tips and general principles

Benefits timescale

- Consider the benefits in the Short, Medium and Long-term.
- The benefits might not be fully realized for up to 10 years.
- These are best estimates as it's impossible to consider the external factors that might positively or negatively affect the end results.

NGen's goal is to add at least $13.5 billion and 13,500 new jobs to Canada's economy by 2030

Tips and general principles

- Don’t lose sight of the NGen scope requirements:
  - What is the Advanced Manufacturing technology or process.
  - What is Transformative with respect to Advanced Manufacturing.
  - What legacy is left in Advanced Manufacturing for Canada.
  - Demonstrate meaningful collaboration.

- Where possible provide evidence for your statements. Do you have market analysis or survey information?

- Use credible sources. Don’t quote Wikipedia.

- When putting together the case and brainstorming, think about what are the differentiating factors within your project that set it aside from all the other projects.

Tips and general principles

- Clearly articulate the answers to the questions. Assessors are looking for a straightforward case.

- Graphs, charts and tables are your friends. Use them for:
  - Market projections.
  - The economic case.
  - To provide a project governance or team structure.
  - Table of the number of Direct and Indirect jobs in the Short, Medium, Long-term

- Avoid quoting the guidance back to the assessors or making general unquantified statements.

Questions and Answers

The 10 Questions

1. What is the opportunity the project addresses?

- Outline the big-picture motivation and the overall advanced manufacturing objectives, that the project intends to achieve.
- Provide an overview of the project considering both technology and business impacts, highlight other strategic benefits.
- Outline what the project team needs to do to successfully achieve the project objectives within the desired timeframe and budget.
- What are the specific challenges, research questions, and/or technical complexities that will be addressed?
- Describe the nature of the challenges facing you and/or your potential customers, along with the potential market challenges or barriers to entry.
- How will the outcomes of the project overcome these challenges?
- Clearly describe the project partners and how the partners will collaborate towards the overall opportunity.

2. What is the overall project and risk management plan?

- Describe the Project and Risk Management approach, identifying key project management tools and mechanisms (e.g. Quality Management Systems) that will be implemented to provide confidence that sufficient control will be in place to minimize risk.

- Describe how you are going to measure the success of the project.

- Summarize your overall project plan, including work-package descriptions and describe the key milestones and deliverables that show how the overall project will be achieved.

- Provide a Project Plan consisting of a Gantt chart (Appendix 1) that details the Work Packages, tasks, timelines, milestones, deliverables, dependencies and resource allocation for all partners.

- Describe the resource and management requirements for successful project completion, including how the work will be shared among project partners.

2. What is the overall project and risk management plan?

WBS Legend and Reference Infromation	
WBS GANT Color Legend	
	Design / Development / Planning
	Sample L/T or Preparation
	Validation or Testing
	Endurance or Scaled Testing
X	Milestone

Key Milestones Register

	Milestone	Date (m/d/y)	Description
1			
2			
3			
4			
5			
6			
7			
8			

Description of WGs and WPs	Description of WGs and WPs
Work Group 1:	
WP1:	
WP2:	
Work Group 2:	
WP1:	
WP2:	

WP and WG	Total cost	Partner activities and resource allocation
Work Group 1:	**$40k**	**Project lead - manages overall project management and governance**
WP1:	**$10k**	**Partner 2**
WP2:	**$30k**	**Lead and Partner 3**
Work Group 2:	**$50k**	Partner 2 takes the lead on all compliance activities
WP1:		Partner 3 supports the testing activities.
WP2:		
Work Group 3:	**$1m**	Lead
WP1:	**$750k**	Lead
WP2:	**$250k**	All

Example only

2. What is the overall project and risk management plan?

- Provide a comprehensive risk analysis including a Risk Register (Appendix 2) Identify the key risks within the project.
- Consider at least the: Technical, Commercial, Managerial and Financial risks
- Other risks to consider may include: Resource, Intellectual Property, Freedom to Operate, Safety, Regulatory, Legal and Environmental risks.
- Provide appropriate analyses of the likelihood and impact of each of the risks along with appropriate mitigation strategies.
- The assessors will be looking to see that all the main risks are identified and that there are sufficient risks within the project to warrant NGen funding and that these risks are appropriately controlled.

3. What is transformative about the project?

- Clearly define the transformative Advanced Manufacturing aspects of the project and what new knowledge pertaining to advanced manufacturing is being created by each partner organization.

- Outline the current state-of-art manufacturing processes and technologies for your industry (or sector) and describe how this project pushes the boundaries in the context of Advanced Manufacturing.

3. What is transformative about the project?

- Identify the extent to which the project is transformative and innovative both technically and/or commercially. Explain how the project has the potential to transform or support the transformation of each partner organization. Provide evidence for these statements.

- This could include the results of:
  - patent searches,
  - competitor analyses,
  - literature surveys.

- If applicable, you should also outline your own background intellectual property rights, as related to the project.

3. What is transformative about the project?

- The transformative impact of each project will be assessed on the following considerations:
    - Will the project lead to technological and business advantages that will allow Canadian companies to leapfrog global competitors and become world leaders in the application and/or production of advanced manufacturing technologies?
    - Will the project provide an enabling platform for further technology development, application, and scale-up in Canadian manufacturing?
    - Will the project be recognized globally as conferring or strengthening Canadian leadership in Advanced Manufacturing?

3. What is transformative about the project?

- If appropriate describe any novel research that will be undertaken as part of the project. Highlight and explain the timeliness and novelty of these research aspects of the project in an industrial context.

- Are the technologies new or are you looking to apply existing technologies to new sectors areas?

4. What is the nature and size of the potential market the project will address?

- Describe the market(s) that you are entering with the development of a new Advanced Technology OR Describe the existing market that you are operating within and how this Advanced Manufacturing opportunity will enhance your competitive position within the market.

- Consider including details of:
  - the target market, including the size, margins, market leaders, key competitors, price competition, barriers to entry

  - adjacent markets where the new knowledge could be commercialized

4. What is the nature and size of the potential market the project will address?

- Consider including details of:
  - dynamics of the market quantifying its current size, including historical and projected growth rates
  - the specific target product, platform and service applications underpinning the market
  - the expected share of market to be captured as a result of this project
  - the opportunity timeline and when you expect benefits to be realized
  - the impact of the project on existing or future customer relationships

- Provide evidence for your statements about the addressable market your project opens-up and outline your strategy for developing market share.

5. What sort of economic benefits is the project expected to deliver to those inside and outside the consortium, and over what timescale?

- Identify the economic benefits the project will have, both for participating project partners and other suppliers / partners both inside and outside of the project.

- Consider the impact in the short (1-3 years), medium (4-7 years) and long-term (8-10 years).

- For each of the project partners (and appropriate suppliers) provide an analysis of:
  - the expected additional revenue that can be generated.
  - the number of direct jobs created and safeguarded.
  - the number of indirect jobs that can be created within the Supply chain
  - expected exports
  - economic impact of new market opportunities or new expanded value chain opportunities

5. What sort of economic benefits is the project expected to deliver to those inside and outside the consortium, and over what timescale?

- Quantify any indirect economic benefits that might be achieved.
- Examples might include the potential cost savings associated with:
  - Reduced downtime
  - A reduce manufacturing footprint
  - Positive environmental benefits
  - Reduced material usage
  - Higher quality output
  - Reduced scrap and warranty.

- Outline the benefits each partner will see, and over what timescale.

- How does the partnership help each individual partner to achieve greater economic growth?

5. What sort of economic benefits is the project expected to deliver to those inside and outside the consortium, and over what timescale?

- Define the economic benefits that the project can have on the whole Canadian Supply Network upstream and downstream.

- Will the project enable more localized supply of material or components? What are the spill over economic benefits that this might achieve?

- Will the project create spin-off business opportunities (new businesses, new or expanded supplier or partner relationships) in Canada?

6. What is the impact on the broader Advanced Manufacturing ecosystem?

- Broader Ecosystem - Leaving a legacy in Advanced Manufacturing.
- Projects must demonstrate a significant and lasting impact on the development and capacity of Canada's Advanced Manufacturing ecosystem.
- Describe how the project will create widespread positive impact, leaving a legacy for Advanced Manufacturing in Canada for the partners and beyond. (considering how the project impacts beyond the partners and throughout the supply network).

6. What is the impact on the broader Advanced Manufacturing ecosystem?

- To highlight this, consider some of the following:
    - Workforce Development:
        - How will the project encourage the engagement of women and under-represented groups in the workforce?
        - Outline the opportunities for attracting, training and developing a highly skilled talent pool (both existing and new staff).

6. What is the impact on the broader Advanced Manufacturing ecosystem?

- To highlight this, consider some of the following:
  - Industry knowledge:
    - Will the project serve as a model or learning platform in Advanced Manufacturing for others? For example, providing tours, or use cases on best practise.
    - Will the project generate intellectual property that can be used by others to accelerate technology applications or scale-up of manufacturing in Canada?
    - Will the project influence the activities of colleges, universities and/or research institutes to support the education of Advanced Manufacturing resulting in the diffusion of this knowledge back into Industry?

6. What is the impact on the broader Advanced Manufacturing ecosystem?

- To highlight this, consider some of the following:
  - Infrastructure support:
    - Will the project help to develop or support the use of tools, testbeds, or data platforms that will foster future technology development, adoption, scale-up, and commercialization activity in Canadian manufacturing?

6. What is the impact on the broader Advanced Manufacturing ecosystem?

- To highlight this, consider some of the following:
  - Collaborative Networks:
    - Will the project further enhance the ability of industry partners, post-secondary education institutions, research centres, and other private and public organizations to work together to strengthen Advanced Manufacturing in Canada?
    - Describe how the project could build greater capacity / provide opportunities and capabilities in the support of Small and Medium Enterprises.

Other Advanced Manufacturing Ecosystem Benefits?

7. How does NGen add value and what additional benefits will be achieved including social and environmental benefits?

- Provide evidence that NGen support is essential to achieve the project goals. Questions to consider:
  - How has the project technical or commercial scope changed due to NGen support?
  - Is NGen funding critical to undertake the project as proposed?
  - Does NGen funding allow the project to be undertaken differently (more quickly, at a larger scale, with more partners)?
  - Would the collaborative partnership have been formed without the project?
  - Is the project too risky for commercial investors?

7. How does NGen add value and what additional benefits will be achieved including social and environmental benefits?

- Describe the Social and Environmental benefits that this project enables for each partner.
- Social Benefits
- Describe any expected social impacts, for example:
  - Diversity and inclusion, including activities that will be undertaken to ensure that women and underrepresented groups are meaningfully represented in, and benefit from, the project
  - Enhanced quality of life
  - Social inclusion/exclusion
  - Public empowerment
  - Health and safety

7. How does NGen add value and what additional benefits will be achieved including social and environmental benefits?

- Environmental Benefits
- Clearly outline the environmental improvements and impacts as an outcome of this project?

Consider:

- GHG, Particulate matter reduction
- Process and Resource Efficiency
- Better Energy Management
- Reduced Volatile Organic Compounds
- Reduced land degradation
- Reduced water usage
- Footprint Reduction
- Reduced emissions due more efficient and optimized transportation and distribution within the supply chain
- Use or Creation of Sustainable Materials
- Reuse, Recycle, and Remanufacturing
- Other Life cycle benefits
- Other sustainability opportunities

- Describe any other benefits that might be achieved as a result of this project. (Regulatory, certification, standards development, regional and policy benefits etc).

8. How will the results of the project be commercialized?

- The response should highlight the new potential business opportunities for each partner in collaboration and individually.

- Outline the commercial spill over opportunities, demonstrating how your activities will contribute to the wider industry and other sectors.

- For each partner describe the activities that will be undertaken to ensure the sustainability and continued growth of the project outcomes beyond the project end date.
- Including:
    - the expected project outputs that will be commercialized - including new or improved products, services, processes, capabilities, and manufacturing technologies.

8. How will the results of the project be commercialized?

- Including (continued):
  - the route to market – what commercialization channels will you exploit to gain customer traction, if possible, identify specific channels being targeted and the timeframe.
  - an outline of the measures for protection, exploitation and dissemination of the project outcomes
  - other market opportunities (considering adjacent markets) that will emerge as a result of this project?

8. How will the results of the project be commercialized?

- Including (continued):
  - opportunities to commercialize the Intellectual Property, include licence to manufacture, licensing of IP, manufacturing or direct sales (IP Strategy Appendix 4)
  - the plan and rationale for the protection of IP and sharing of IP among your consortium partners and, beyond this, with other NGen members. Including a patent filing strategy for domestic and foreign jurisdictions, changes to business models or processes, research and development (R&D), manufacturing services (IP Strategy Appendix 4)

9. What is the collaborative nature of the project including the partner skills and experience, to deliver the identified benefits?

- Describe the collaborative nature of the project and how the consortium working together will achieve more than if they were working individually.
- Describe how the project partners will:
  - develop relationships and build trust
  - increase knowledge sharing
- Describe any additional collaborative activities related to suppliers, sub-contractors, academic or research organizations involved in the project.
- Consider using the IP Strategy (Appendix 4) to demonstrate the nature of the collaboration in terms of the licensing and access to background and foreground IP during and after the project.

9. What is the collaborative nature of the project including the partner skills and experience, to deliver the identified benefits?

- Describe the track record of the project team members in undertaking and exploiting the results of research and development projects, to show your capability to develop and commercialize the technology.

- Consider whether:
  - the project team has the right available mix of skills and experience to deliver the project successfully. Provide a description of the partners track record in achieving similar manufacturing R&D projects.
  - appropriate governance structures between the consortium partners are in place to manage and deliver the project, consider providing a high-level diagram
  - the make-up of the consortium, along with their knowledge and experience will help improve the capabilities of the Canadian supply chain during the project and beyond
  - there is appropriate access to facilities and resources, including identifying and allocating appropriate space and/or infrastructure in order for the project to be successful (consider floor space, specialized equipment needs, specialist resources etc.)

10. What is the financial commitment required for the project?

- Indicate the anticipated project cost, making clear the level of contribution from any project participants and the level of funding required from NGen. This information should be provided in the financial workbooks.

- Supporting information and explanation for project costs should be provided in this section. For each partner explain how the funding will be used and why it is required for each of the main cost categories in the finance workbook (Labor, Subcontract, Equipment, Materials, Travel and Other eligible costs).

- Provide a breakdown of the costs per work package, showing how it aligns with the project plan.

10. What is the financial commitment required for the project?

- In evaluating the project, the assessors will consider the following questions:
  - has a realistic budget breakdown been provided is the budget realistic for the scale and complexity of the project?
  - is a financial commitment from other sources demonstrated for the balance of the project costs?
  - have the costed work package breakdowns been described and justified adequately?

- Ensure that all key points relating to the finances are described. For example:
  - the reason for, and use of, subcontractors, their impact on the project, and why they are not formal project partners.
  - a justification for any pieces of capital equipment exceeding $1M (NB: these costs require Ministerial approval).

10. What is the financial commitment required for the project?

- Please describe other private sector co-investment/financial contributions that this project will attract in the short, medium and long-term, identifying any future planned follow on funding.

- Please outline other government funding, including stacking limits, that this project has secured or plans to secure against the project.

- Describe how the project can help attract or retain and promote industry investment and product mandates in Canada.

- Assessors will consider the above aspects as well as a determination of the value for money for NGen funding, considering the total potential impact and return of the project against the amount of funding being requested.

Intellectual Property Strategy

- The Supercluster program puts a focus/importance on Intellectual Property
- A Project IP Strategy is a requirement for every project
- IP Strategy Deep Dive Workshop on June 15th
- https://www.ngen.ca/news-events

Summary and Final Tips

- Answer the questions.
- Quantify answers.
- Provide succinct answers.
- Plan the project with your partners.

Second pair of eyes

- When you have a draft, ask someone that understands how to write a business case and project plans, that has not been involved in the project to read the 10 questions along-side the guidance to determine if a fresh pair of eyes picks up on the same points as the project team preparing the proposal.

Independent Assessment

- 5 expert assessors separately, anonymously and independently score projects before the assessment panel meets to discuss the highest scoring proposals.
- Assessors are screened for conflict of interest, are under NDA and do not represent a particular organization.
- Assessors conduct an evaluation in three parts:
  1. Scope Gateway – Is the project in scope for NGen Funding?
  2. Overall recommendation Gateway – based on the information presented, would you recommend the project for funding?
  3. Assess and score 10 Evaluation questions - 10 marks per question application; scored out of 100 marks.
- The assessment will only be based on the information contained within the application.

- Links to websites are not permitted within the applications. If the information is important it should be incorporated into the application and with an appropriate source reference.

You're Approved!

Consortium and NGen sign a Master Project Agreement.

We Kick-off the project

Key Dates

Project intake deadlines:

- Feasibility Studies and Pilot Projects:
  - 16th June 2021,
  - 6th July 2021,
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- **Tuesday 15th June 2021 – 1pm EST**

Questions and Answers

Thank You!

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Canada's Advanced Manufacturing Supercluster

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