MICA ADVANCES TO FULL APPLICATION

August 20, 2020 1:00 – 2:00 pm

Presented by:
Douglas Morrison President/CEO
Charles Nyabeze VP Business Development
Sherry Greasley VP Business Administration

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WEBINAR AGENDA

• Introductions (CN)
• Lead applicant (DM)
• MICA overview (DM)
• Government of Canada economic development objectives (DM)
• Who can participate in MICA? (CN)
• Strategic Innovation Fund (SIF) Stream-5 (CN)
• Required MICA Outcomes (KPIs) (CN)
• MICA Network Program Components (SG)
• Qualifying MICA Projects (SG)
• Technical Themes (CN)
• MICA benefits (CN)
• How to participate in MICA (CN)
• Questions and Answers
MICA WEBINAR GUIDELINES

- Slides in PDF format will be sent to all Webinar participants.
- All Participants will be placed on mute for the first 40 mins.
- Participants that want to ask questions can:
  - Type them into the zoom application chat box.
  - Raise your hand via the zoom application.
- Email questions via cnyabeze@cemi.ca.
- The last 20 minutes will be for Questions and Answers.
We would like to acknowledge the support of Glencore and Vale in providing resources to advance the MICA proposal.
MICA Advances to Full Application

TIMELINE:
• Statement of Interest (SOI) submitted to Federal Government August 2019
• Broadened the Network & secured Letters of Interest
• Continued discussions with officials in Dept. Innovation, Science & Industry
• August 10, 2020 - Approval to advance to Full Application Stage
• Committed to submit the Full Application by October 12, 2020

FULL APPLICATION:
• Comprehensive application based on submitted SOI
• Main requirement for matching contributions by Network Members
• Subject to due diligence, including internal and external expert reviews
Lead Applicant: CEMI

CEMI: Track Record

• 2007 Created: Ontario, Inco & Xstrata – then leaders in mining innovation focus - innovation & delivery, benefit to industry, not member-driven

• Managed national programs -12 years, total leveraged over $114M

• Escalating Programs: $6M VOD, $7M Vale Centre, $8M SUMIT, $10M Rio Tinto Centre, $35M UDMN, ($140M MICA)

• 153 projects, 146 HQP/Jobs, 25 Patents/IP, 4 Prod/Services (7yrs)

• Collaborators: >130 Cdn SMEs, 20 Mining Co., 8 Countries

• UDMN (4yrs.): National (BC-QC), 27 industry projects (78), 42 SMEs 10 Prod/Services, 20 mining companies, 14 academia & other

• UDMN Benefit to SME Project Proponents - min. $0.85/$1 invested.

• UDMN Symposium - 25 SMEs, B2B collaborations, shared export expertise, business acumen, joint resources (legal, IP)

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**Funding program**: Strategic Innovation Fund Stream 5 (SIF-5)
**Ministry**: Innovation, Science and Industry (ISI)
**Minister**: Honorable Navdeep Bains

**Proposed SIF-5 Funded Program Details**
**Program Name**: Mining Innovation Commercialization Accelerator (MICA)
**Lead Applicant**: Centre for Excellence in Mining Innovation (CEMI)
**Program Duration**: 5 years
**Program Value**: $140M ($100M private and public contributions)
**Funding Request**: $40M
**Technology Readiness Level**: Late-stage projects (TRL6-8)
**Scope**: Connect Regional Mining Clusters to Cross-Sector Innovation Centres to create a National Mining Innovation Ecosystem

**MICA Vision**:  
Use the Canadian advantage of SME-based innovations to create a national technology ecosystem for mining and lead the transition to a low-carbon future.

**MICA Mission**:  
- Build a national ecosystem as a network of collaborative regional clusters  
- Create regional networks to rapidly increase domestic and export sales  
- Scale-up Canadian SMEs to participate in global mining supply chains  
- Accelerate the number and scale of home-grown Canadian mining SMEs  
- Commercialize new, late-stage, high-impact mining technologies

**MICA: Technical Themes**  
1. Increase Mine Productive Capacity, at Lower Cost.  
2. Reduce Energy Consumption and GHG Emissions.  
3. Mitigate environmental risk and long-term liabilities.  
4. Implement Smart, Autonomous Mining Systems.

**Critical Path Timelines**  
**SOI submitted**: August 2019  
**SOI approved**: August 10, 2020  
**Full Application submitted**: October 2020  
**MICA launch**: January 2021

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GOVERNMENT OF CANADA OBJECTIVES

1. Increase economic activity in Canada
2. Increase number of jobs in Canada
3. Increase made-in-Canada SME solutions
4. Expand export capacity and sales

Post-Covid economic recovery needs accelerated innovation and commercialization.
WHO CAN PARTICIPATE IN MICA?

Members of:
- CIM
- MAC
- CMIC
- MiHR
- MISA
- MSTA
- PDAC
- SIMSA
- MSABC
- MININGNL
- MINECONNECT

Supported by:
- CanmetMining
- NRCAN
- TCS
- EDC
- NRC

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CURRENT MICA PARTICIPANTS
STRATEGIC INNOVATION FUND OBJECTIVES

Support large-scale national innovation ecosystems through high-impact collaborations across Canada

Foster collaboration between multiple organizations including SMEs incubators/accelerators academic and research institutions and large corporations in order to accelerate commercialization in areas with demonstrated Canadian advantage

Build upon existing regional or national networks and have a high impact approach to technology development, commercialization, business development, scale up and market growth. Target sector should have both domestic growth and export potential.

SIF-5 program network funding minimum $10M and maximum $50M

1. To build the network national network SIF requires Key Partners from across the country (regional clusters and supporting organizations collaborating to form a national ecosystem)

2. Technical projects
   Late-stage TRL6-8, industry supported (*cash & in-kind commitments)

*only cash contributions are eligible for match

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REQUIRED MICA OUTCOMES (KPIs)
(subject to SIF-5 program requirements)

Regional, National, Global

- #jobs (created and retained)
- $New company revenue (domestic, international)
- #New companies (startups, spinoffs)
- $Total investment (leveraged)
- #MICA Members (mining sector, cross-sector companies)
- #Technology applications in other sectors
- #New products and services (prototypes, IP, patents, standards)
- #HQP developed (skills, training, development)
- #Network events (regional, national, international)
MICA NETWORK PROGRAM COMPONENTS
(subject to SIF-5 program requirements)

Business Structure
Manage the national network

Network Activities & Events
Build and link the national network

Technical Themes (TRL 6-8)
Projects that bring new innovations to market
MICA BUSINESS STRUCTURE
(subject to SIF-5 program requirements)

- Governance: Board Oversight
- Management & Operations
- Project RFP’s and Project Selection
- Project and Network Intellectual Property Policy
- Network Activities
MICA Governance
(subject to SIF-5 program requirements)

• **Board of Directors** - Oversight and overall responsibility for fulfilment of Funding Agreement

• **Board Policy Categories** - Strategic outcomes, Board-Mgmt. delegation (i.e. operational), Risk Limit (i.e. financial etc.), Governance Process (i.e. code of conduct/ conflict of interest etc.)

• **Board Composition** i.e. 12, ⅓ independent, independent of funding

• **Board Competency Matrix** - board member selection (EDI lens)

• **Board Committees** - i.e. nomination/EDI, ICG, project selection, project performance, regional performance, finance/audit

• **Board Ratifies** - budget, agreements, committee recommendations

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MICA Management and Operations
(subject to SIF-5 program requirements)

- Central office (Sudbury), Satellite Office(Toronto), Regional Clusters
- Agreements (3): Network, Contribution, Project
- Program Management – Claim-based, tracking, progress reporting, liaison with ISI, financial reporting & Audit
- Project Reporting – Project progress and network activities (all activities undertaken in the Network are considered projects)
- Regional Clusters: Regional activities, progress reporting, participation in national ecosystem activities
- Long-term sustainability of the MICA Network (SIF-5 requirement)
MICA Project Selection
(subject to SIF-5 program requirements)

• Project selection flow chart established

• Begins with RFP

• Industry Consultation Group (ICG) – guidelines and industry priorities

• Project selection committee that reports to the Board of Directors

• Project selection criteria to be finalized – network & technical projects – budget, schedule, TRL6-8, technical and market readiness, alignment with themes, Canadian entities, SIF KPI’s

• Project commercialization path requirements
MICA IP Strategy
(subject to SIF-5 program requirements)

• Network Agreement – overarching IP strategy – all members sign an identical agreement to belong to the Network

• Project Agreement – specific IP between parties – Background IP & Network Supported IP

• Project proponent owns the Network Supported IP

• Customized agreements for joint, shared & pooled IP

• Project participants and Network Members– can receive preferential benefits

• IP must be mobilized within a set period of time and remain within Canada for the duration of the MICA Project
MICA NETWORK ACTIVITIES AND EVENTS
(subject to SIF-5 program requirements)

- Networking events (regional and national)
- Online portal, Webinars
- Newsletters
- Conferences & Trade Shows
- Seminars – knowledge transfer, best practices
- Trade missions
- Export and Supply chain development
- Commercialization Support Services – project specific
- Ecosystem mapping
- Other

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### MICA TECHNICAL PROJECTS

**WHAT MAKES FOR A QUALIFYING MICA PROJECT**

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirements</th>
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</table>
| **a) overall requirements** | Is it made in Canada  
Is it TRL level (6-8)  
Can it be completed within 4.5 years?  
Is the project IP Secured or pending?  
Has matching funding been identified? |
| **b) requirements** | Is the project addressing an industry validated challenge/problem?  
Has the project identified the required partners and end-users?  
Has a technical validation been conducted?  
Has a business case been conducted?  
Does the project fit within one of MICA’s technical themes?  
Does it result in a safer work environment or community health and safety?  
Has a risk of adoption analysis been conducted?  
Does the project have potential for adoption by more than one end user? |
| **c) outcomes & KPIs** | Will jobs be created/retained?  
Will the project result in a new company or a spinoff?  
Does it have other applications in other industries/sectors?  
Will further IP be developed (patents applied for)?  
Does it result in export to global markets?  
Does the project have a path to market?  
Does it improve social license to operate (ESG)?  
Will it consider equity and diversity? |
QUALIFYING PROJECT CONSIDERATIONS
(subject to SIF-5 program requirements)

- SIF-5 Program is claims based
- MICA requires cash contributions for projects by participants
  Federal contribution range of $1.00: $0.30-$0.50
- A contribution towards network activities required
- In-Kind is not eligible for matching – but encouraged
- Regular quarterly project reporting (technical and financial)
- Eligible expenditures as per Federal Government guidelines.
MICA TECHNICAL THEMES (TRL 6-8)

Increase Mine Productive Capacity, at Lower Cost.
Enhanced Productivity (Health, Safety, Value Extraction, Processing, Metallurgy)

Reduce Energy Consumption and GHG Emissions.
Energy Efficiency, Elimination of diesel, BEV applications, Renewables & GHGs

Mitigate environmental risk and long-term liabilities.
Waste and Waste-water Management (Water Quality, Acid Mine Drainage, Human health Impacts, Remediation & Genomics)

Implement Smart, Autonomous Mining Systems.
AI, Automation, Digital Technology – twins, Simulations

Technology Readiness Levels (TRLs)

Research

<table>
<thead>
<tr>
<th>1</th>
<th>Basic Idea</th>
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<tbody>
<tr>
<td>2</td>
<td>Concept Development</td>
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<tr>
<td>3</td>
<td>Proof of Concept</td>
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Demonstration

<table>
<thead>
<tr>
<th>4</th>
<th>Process Validation in lab/pilot</th>
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<tr>
<td>5</td>
<td>Production Process Validated</td>
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Commercial Adoption

<table>
<thead>
<tr>
<th>6</th>
<th>Process Capability Validated</th>
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<tbody>
<tr>
<td>7</td>
<td>Capability, Economics Validated</td>
</tr>
<tr>
<td>8</td>
<td>Range of Parts Validated</td>
</tr>
<tr>
<td>9</td>
<td>Market Ready</td>
</tr>
</tbody>
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MICA BENEFITS TO NETWORK MEMBERS

1. Accessing **leveraged funding** to develop and commercialize technologies.
2. Identifying **early adopters** of technologies.
3. Creating solutions to secure **competitive advantage**.
4. Access to **testbeds in mining** and plant operations.
5. Leveraging the **complementary technologies** and capabilities of network members.
6. **Identifying** mining/plant operators interested in **supporting** SME led projects.
7. Leveraging the **capabilities** of the Canadian mining and innovation network.
8. Contributing to the development of **made-in-Canada** of clean-technologies.
9. Access to **validated** and **vetted** mining and plant operational challenges.
10. **Participating** in MICA Network events, conferences, webinar, seminars.
11. Identifying and accessing **export markets**.
12. Validate ideas and access to **private equity**.
Mining companies/plants, SMEs, OEMs, and Innovators that currently service and those interested in servicing the mining industry are welcome to participate. MICA is open to helping advance innovations (mostly TRL 6-8) from any of Canada’s industry sectors into the mining industry. We strongly believe that new cross-sector ideas will help transform the mining industry.

Once MICA is approved by ISI, there will be a Network Participation fee (tbd). Participation in the MICA Network is activity based (all) and project based.

Process

• Request MICA’s participation package
• Submit a MICA Letter of Commitment (template provided)
• Submit a Project Information Form (template provided)
• Return completed Letter of Commitment and Project Information Forms by 4:30 pm EDT Friday, September 11, 2020

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QUESTIONS AND ANSWERS

- Submit questions via the chat
- Email questions to cnyabeze@cemi.ca
- Request Letter of support template via info@cemi.ca
- Invite your peers to join MICA
- Request for information on MICA via info@cemi.ca
- More information on MICA www.cemi.ca/mica
Contact Us

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