**POLYTECHNICS**CANADA

# Response to the Capstone Research Organization Consultation

## Context

Significant literature exists on Canada's struggle with innovation and productivity. A common narrative is that we have a strong research base but lag when it comes to transforming ideas into economic and societal impact. Despite substantial public investment in R&D by the Canadian government, the nature of this spending has had limited impact on the country's capacity to solve real-world challenges. A driving ambition of the new capstone research organization should be to make academic research a crucial part of the innovation supply chain, establishing new ecosystem models designed to translate Canada's research expertise into economic impact.

Much like its peer countries, Canada is seeking pragmatic solutions to pressing national challenges, including net-zero transition, the slow adoption of productivity-boosting technology, a housing crisis and an aging population. As the Canada Research Coordinating Committee gathers the research community's feedback about the new umbrella organization, Polytechnics Canada recommends establishing an organization focused on these priorities. We believe the structure of the new capstone research organization should support the adoption of a mission-driven approach to thorny national and international challenges, with the flexibility to address others as they arise.

## Priorities

The new capstone research organization offers a unique opportunity to better map and exploit Canada's rich research ecosystem and areas of expertise across the post-secondary sector. An uneven playing field and a poor understanding of ecosystem strengths make it difficult to connect researchers and expertise across disciplines, institutions and even internationally.

Strategic use of these capabilities stands to draw on complementary strengths, as well as space, equipment, international linkages and industry partnerships, to better address topics of national interest whether economic or social in nature. Such an approach requires the new organization leadership to fully appreciate capacity in every corner of Canada's research ecosystem.

We recommend this effort begin with a comprehensive review of networked research models and best practices in Canada and abroad for examples of challenge- and/or expertise-driven collaborations. These approaches may guide future programmatic and funding decisions. A brief description of the European Universities initiative, which include substantive contributions from applied institutions, has been attached for consideration.

Within Canada, we would point to the Southern Ontario Network for Advanced Manufacturing Innovation (SONAMI) as an example of a challenge-driven network. This model brings institutions together – now with nine colleges and two universities involved – to better serve industry through a single point of access. With wide-ranging expertise, the network has already collaborated with

more than 300 industry partners on 460 projects in Southern Ontario, with aspirations for national reach and scale.  SONAMI exemplifies a network that shares best practices, maximizes return on investment and explores new collaborative models.

Recognizing an established bias for investigator-led research of the type undertaken by traditional universities, where 97.1 per cent of all Canadian government investment in academic research currently flows, we feel it necessary to explicitly ask that an examination of ecosystem strengths include polytechnic and college capacity.  Canada is currently underutilizing the sector's expertise when it comes to undertaking research informed by partners including businesses, non-profits, governments and other public players.  Strategic engagement and program design dialogue should seek to overcome this bias.

Industry engagement in research collaborations should be an important goal of the new capstone research organization, driving input from those positioned to inform the problem statement and implement solutions.  To support industry involvement, we recommend systems support efficient decision timeframes to ensure the new organization operates at the speed of business.

*Key Recommendations:*
- Identify priorities and focus for the new capstone research organization
- Assess capacity and expertise to address those priorities across the research ecosystem
- Encourage and support inter-disciplinary partnerships, including with industry partners who are positioned to test and implement research findings

## Structure

Unlike traditional research investments that assume discovery research will trickle into the market, we recommend that the new organization activate research expertise from the entire research community to work collaboratively in a challenge-driven environment.  By requiring a diversity of contributors, such a model would encourage participation across the university-college divide, drawing on the strengths of the entire ecosystem.

Giving coherence to the domain-driven research supported by the Tri-Council agencies and driving mission-driven, interdisciplinary research will require insights from and the expertise of contributors outside of today's research structure.  We recommend that the governance structure be informed by a clear ambition to drive collaboration among experts across disciplines, ideally with a primary focus on creating economic and social impact.

This approach requires a diversity of contributors with knowledge of the current strengths in our domain-driven system but suggests that other voices will play a critical role.  The advisory board should include representatives of business, non-profits, Indigenous communities, polytechnics and colleges to ensure a greater breadth of expertise inform the capstone research organization.  To

ensure these voices are adequately heard in program design, we recommend the President come from industry rather than the research community.

The new capstone research organization must also have a standalone budget that enables it to undertake mission-driven research separate from the Tri-Council agencies.  This will ensure the new organization can encourage and support new models and approaches to research, better addressing the pragmatic challenges Canada faces.  For example, collaborative projects undertaken under the direct purview of the capstone organization can experiment with approaches that allow business partners to retain intellectual property.  In our sector's experience, businesses consider unencumbered intellectual property to be essential to partnering with academic institutions.  This enables them to secure capital and grow their businesses without restriction.  It also encourages them to more openly engage in R&D activity in collaboration with academic institutions.

Systems of the new organization must enable funding to flow at the speed of business to further encourage broad participation.  Lengthy review processes may make it difficult for partners from outside the research community to commit to contributing.  We recommend the structure encourage network development ahead of project design, drawing together researchers and institutions with focused areas of expertise, ideally with access to operational funding.  By identifying initial missions upfront, it will be possible to develop expert networks and ensure funding to support their activities is in place.  We recommend the design of the Mobilize program within the College and Community Innovation Program be considered as a model.  That program commits five years of funding, providing both long-term financial certainty and the flexibility to identify projects and partners as time goes on.  Business partners are a key beneficiary because their projects can begin without additional delay.

### *Key Recommendations:*
- Ensure the organization's Advisory Board is made up of diversity of stakeholders, ideally with a majority from outside the traditional research community
- Organization leadership should come from industry, where a challenge-driven mindset will encourage and enable new approaches
- Provide the organization with a standalone budget to support mission-driven network development and projects, preferably one that encourages new approaches to intellectual property and enables the engagement of industry players

## Future Ambitions

We believe polytechnics are under-utilized and under-resourced partners in translating academic research into economic impact.  As the new capstone research organization addresses national challenges, it is essential for its future mandate to consider mechanisms for more evenly distributing research support funding.  This would ensure that all players in the academic research ecosystem

have the necessary resources to build and sustain infrastructure aimed at solving national challenges.

As this new organization is established, it will also be critical to consider how existing and long-standing eligibility requirements support the status quo and make it difficult for new actors to participate.  Barriers include:

- Lack of faculty-release provisions
- Relatively few programs/grants that enable polytechnic/college leadership
- Application processes geared to individual PIs rather than Research Offices
- Adjudication criteria that favour research-intensive CVs
- Decision timeframes that discourage industry involvement

A comprehensive future review of federal research funding programs is crucial to identify opportunities where polytechnics and colleges can contribute to national priorities and industry needs.  Polytechnics excel in applied research that directly addresses practical challenges and fosters innovation in key sectors such as advanced manufacturing, clean technology and healthcare.  Evaluating existing programs through this lens can unlock new avenues for collaboration and ensure that funding opportunities are accessible and tailored to their strengths.

There is an additional need to increase equity, diversity and inclusion in research.  As we train the next generation of researchers, it is vital to address biases in the current system that put future research ambitions at risk.  A key component of the new organization should focus on addressing barriers and discrimination faced by equity-deserving groups, including women, Indigenous peoples, persons with disabilities, visible minorities/racialized groups and LGBTQ2+ communities.

To address these issues, we propose a future ambition of the organization be launching a program similar to the Dimensions program with long-term funding attached.  The objectives of the Dimensions program were widely supported and, to deepen its impact, institutions will require ongoing financial support.

*Key Recommendations:*
- Dismantle existing barriers to the full activation of applied institutions within Canada's research programming as a way to better translate research to economic and social impact
- To ensure greater equity, diversity and inclusion in Canada's research community, provide long-term funding for the Dimensions program

## Conclusion

Though Canada's research spectrum encompasses everything from discovery research to pragmatic applied supports for business partners, funding structures haven't evolved to include new approaches and new players.  An uneven playing field and poor understanding of

ecosystem strengths make it difficult to connect researchers and research expertise across disciplines, institutions and across the country, let alone internationally.

There are opportunities to better map and exploit Canada's rich research ecosystem and areas of expertise across the post-secondary sector.  This stands to enable collaboration beyond established local/regional relationships on topics of intense or emerging national interest, such as climate change and housing, particularly as these priorities require a breadth of expertise, space, equipment and technology.  We consider this an important role for the new capstone research organization.

We encourage an examination of networked research models and best practices in Canada and abroad for exemplars of challenge- or expertise-driven collaborations.  These approaches should inform the new capstone research organization's primary purpose, driving greater impact on challenges of national and international importance.

## Appendix A – European Universities initiative

The European Universities initiative is aimed at establishing alliances between institutions from across Europe.  It is implemented primarily through Erasmus+ funding.  In addition, they can access national or regional funding for research and innovation, as well as other EU resources.

Erasmus+ supports the set-up and running of the European alliances through calls for proposals.  Under the budgetary period of 2021-2027, Erasmus+ will assign approximately €1.1 billion to the European Universities initiative.  This means up to €14.4 million available for each alliance covering four years.  Alliances may be able to extend this period by two additional years.

In addition to dedicated funding streams, Erasmus+ funding opportunities linked to student and staff mobility and innovation are available.

By developing long-term structural, strategic and sustainable cooperation between higher education institutions, the European Union aims to improve the international competitiveness of higher education institutions and promote European values and identity.

Higher education institutions that are part of an alliance form a European University.  These can include all types of higher education institutions, including:
- research universities
- university colleges
- universities of applied sciences
- universities of technology
- universities of arts

The higher education institutions involved in an alliance work together with partners from outside the educational field to solve concrete societal problems.  Such partners can include the private sector (including SMEs and start-ups), local, regional and national public authorities, and civil society.

European Universities develop and implement an integrated long-term joint strategy for education with, where possible, links to research and innovation.  To achieve this, they are using joint management and governance structures and are building on a shared pool of resources in areas including human resources, data and services, finances, administration and infrastructure.

This approach enables access to high quality and inclusive education, research and innovation which is aligned with digital adoption and green transition while responding to the major challenges in today's society.