CARIC

CONSORTIUM FOR AEROSPACE RESEARCH AND INNOVATION IN CANADA

A National Collaboration Initiative for the Canadian Aerospace Industry

AIAC Pacific – Outreach Program

Camosun Victoria – 30 April 2015

Funding partner:

Industry Canada Industrie Canada

Canadian Aerospace Industry*

- **Economic Impact**
  - Over 700 companies - 172,000 jobs
  - Contributes $28B of GDP to the Canadian economy
  - 80% of its production is exported
  - 70% Manufacturing and MRO, 30% services

- **Canadian Aerospace Activity**
  - 3rd in terms of global civil aircraft.

*Aerospace Industries Association of Canada & Industry Canada (2014). *The State of the Canadian Industry*

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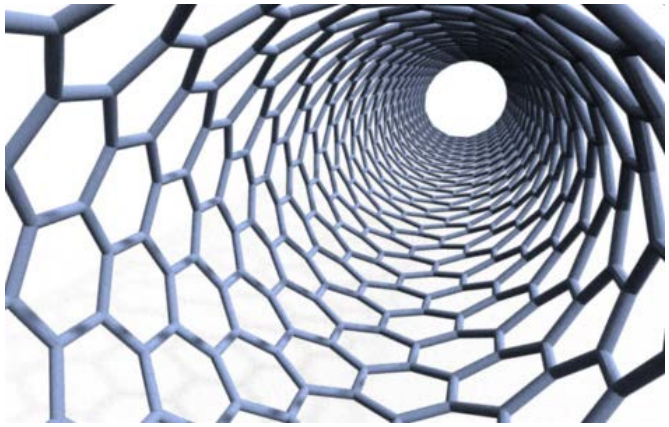
Canadian Aerospace Industry*

Innovation

- 20% of the industry's activity is R&D
- Each year the industry invests $1.7 billion into R&D
- 5 times R&D intensity of Canada's manufacturing average
- R&D investment increased by close to 40% in the last five years



*Aerospace Industries Association of Canada & Industry Canada (2014). *The State of the Canadian Industry*

Image credit: James Hedberg

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Canadian Aerospace Industry

Business & Technological Challenges

- Very high demand for next 20 years – Half of it in Asia
- Very innovation intensive
- Long development cycles
- Tight benefit margins of the airlines, airports (the customer)
- Global competition
- Tighter environmental legislation
- Development of supply Chain
- Manpower
- Infrastructure

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About CARIC

*"Collaborative approaches to R&D yield **better results for both participants and the economy**. This is particularly true for an industry like aerospace, in which R&D is a costly, long-term undertaking."* – Emerson Report

- Officially launched in April 2014
- $30M financial support from Industry Canada

Honourable James Moore, announcing his endorsement of the creation of a new national aerospace research and technology network.

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CARIC's Mission

1. To **facilitate communications** and **collaboration** among aerospace companies, researchers and academics…

…and provide **financial support to collaborative R&D** projects.

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CARIC's Mission

2. To **launch initiatives** whose primary purpose is to:
   - serve as **catalysts for collaboration** that can help to overcome the silo effects;
   - promote **faster, more relevant R&D**.

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Our *raison d'être*

- Our **core business**: R&D projects that lead to **innovative solutions**
  - Industry focused

- Our **vision**: a **key facilitator** for the Canadian aerospace research and technology development

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Industrial Members

Universities, Colleges and Research Centres

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Outcomes - Metrics

1) CARIC accelerates aerospace research

- Research projects launched (TRL 1-6)
- Involvement: academia, research centres and industry
- Funding provided and leveraging factor
- Technologies developed

2) CARIC supports student training

- Students trained
- Involvement of colleges

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Outcomes - Metrics (cont'd)

3) CARIC facilitates aerospace network outreach

- Research Forum & Workshops on cutting edge research fields
- Web Community Portal usage

4) CARIC supports the innovation system

- Inventory of research infrastructures
- Technological road-mapping
- Mobilizing SMEs

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Coast-to-Coast Footprint

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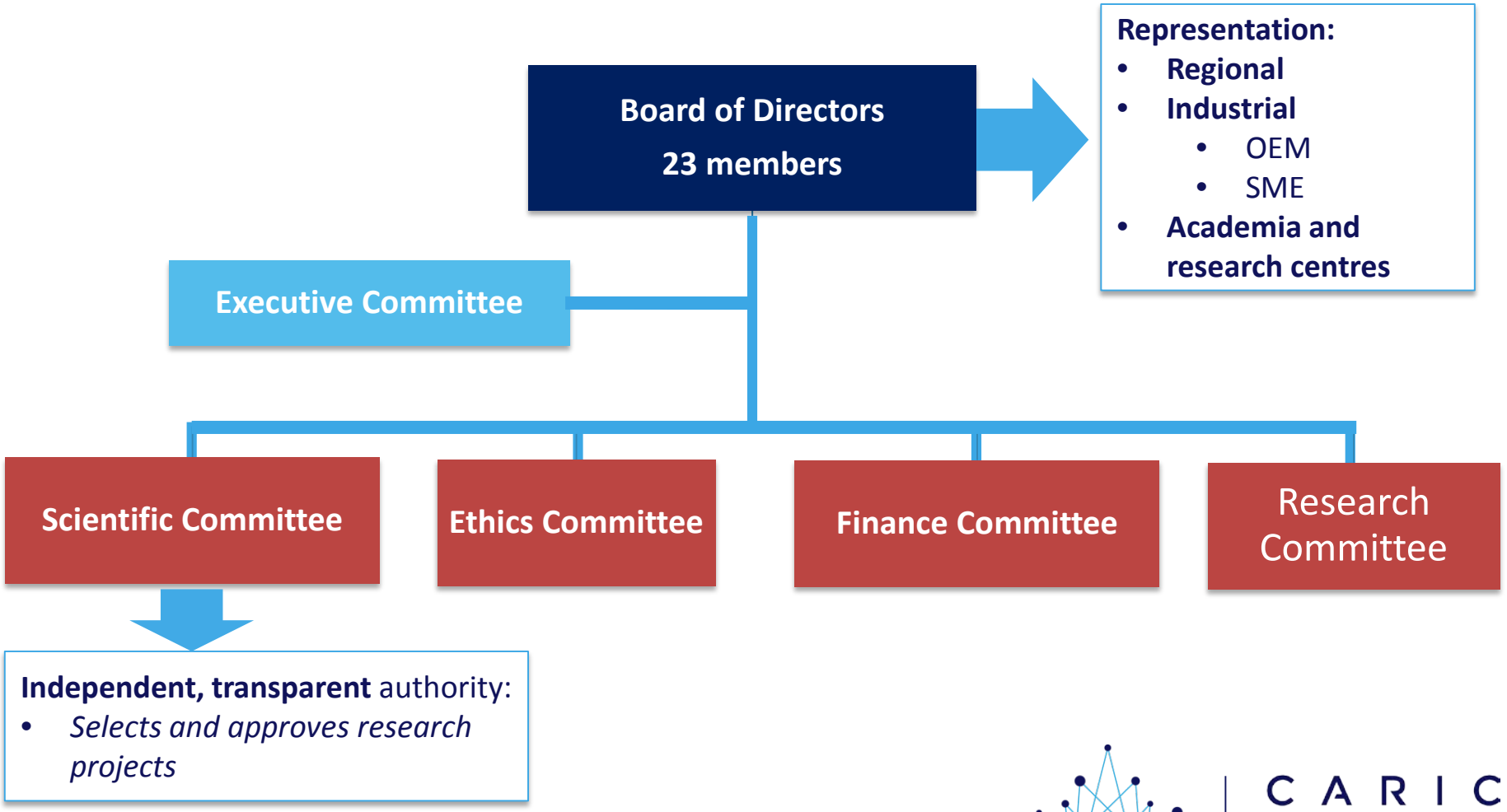
Governance



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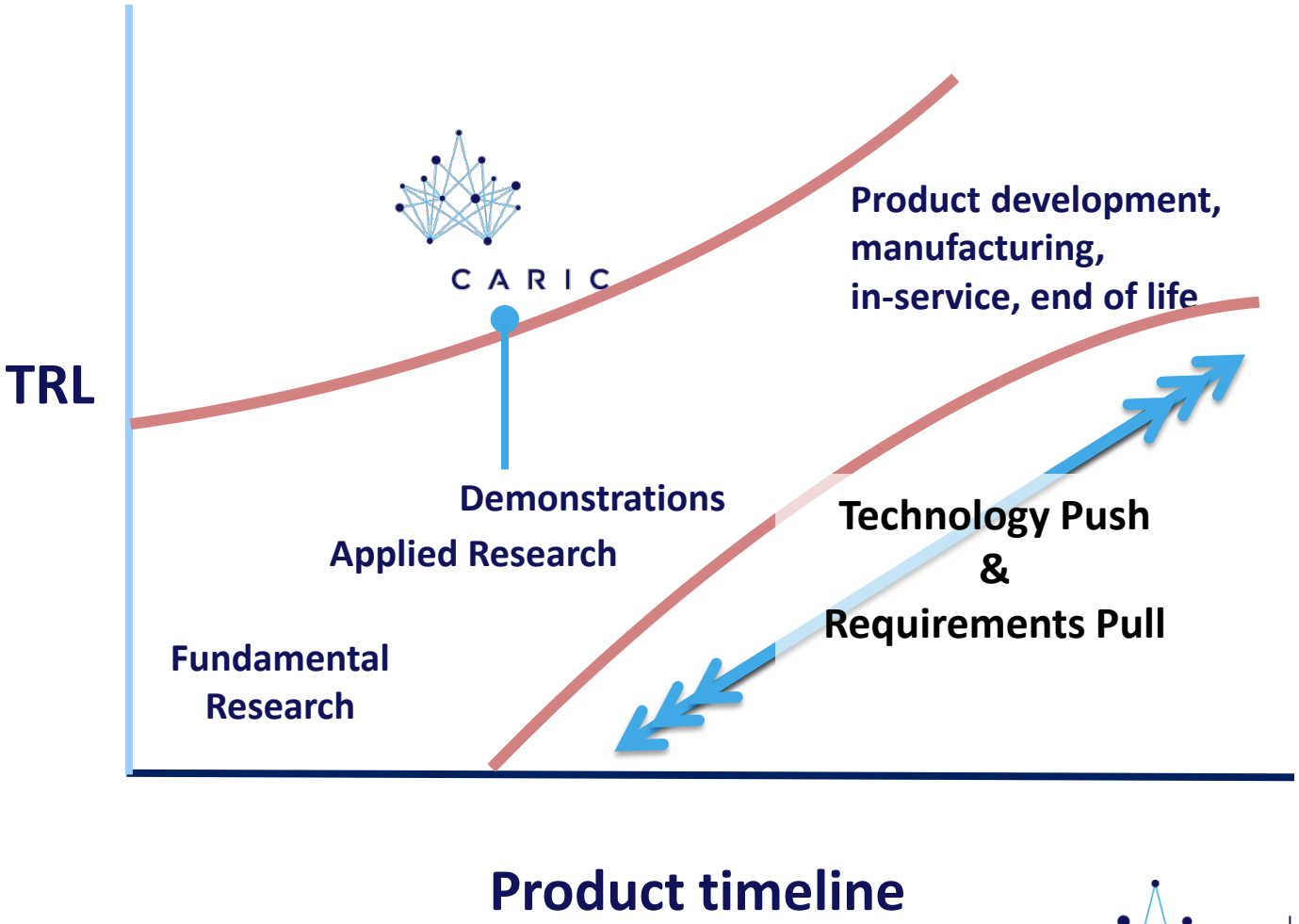
Canadian Aerospace Research Continuum



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Tackling Real-World Issues

- **Fabrication costs** (new materials, robotics, optimized processes)
- **Cost of operations** (optimized routes (IT), avionics, control systems)
- **Protection of the environment** (fuels, optimized routes, noise reduction)
- **Airborne security** (information systems, sensors, certification of materials)
- **Airfield security** (sensors for traffic control, de-icing)
- **Well-being** of the crew and passengers (interior design, human factors)
- **Training** (simulation)

Research Themes

Program management framework

Acoustics, noise control, environment, security, icing (ENV)	**Composites** (COMP)	**Modeling, simulation, multidisciplinary optimization** (MDO)
Air operation and human factors - organizational innovation *(OPR)*	**Diagnostics, pronostics, surveillance of components** (DPHM)	**Product and system development, productivity** (PLE-P)
Autonomous systems (AUT)	**Interior design** (INT)	**Supply chain optimization and LEAN** (LEAN)
Avionics and control (AVIO)	**Manufacturing and assembly processes, quality assurance** (MANU)	

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1st Research Forum

Focus: generate project ideas

- Jointly with **CRIAQ's 7th Forum**
- April 16-17, 2014
- Official launch of CARIC
- **1,300** registered participants
- **89** submitted project ideas
- **10** represented countries

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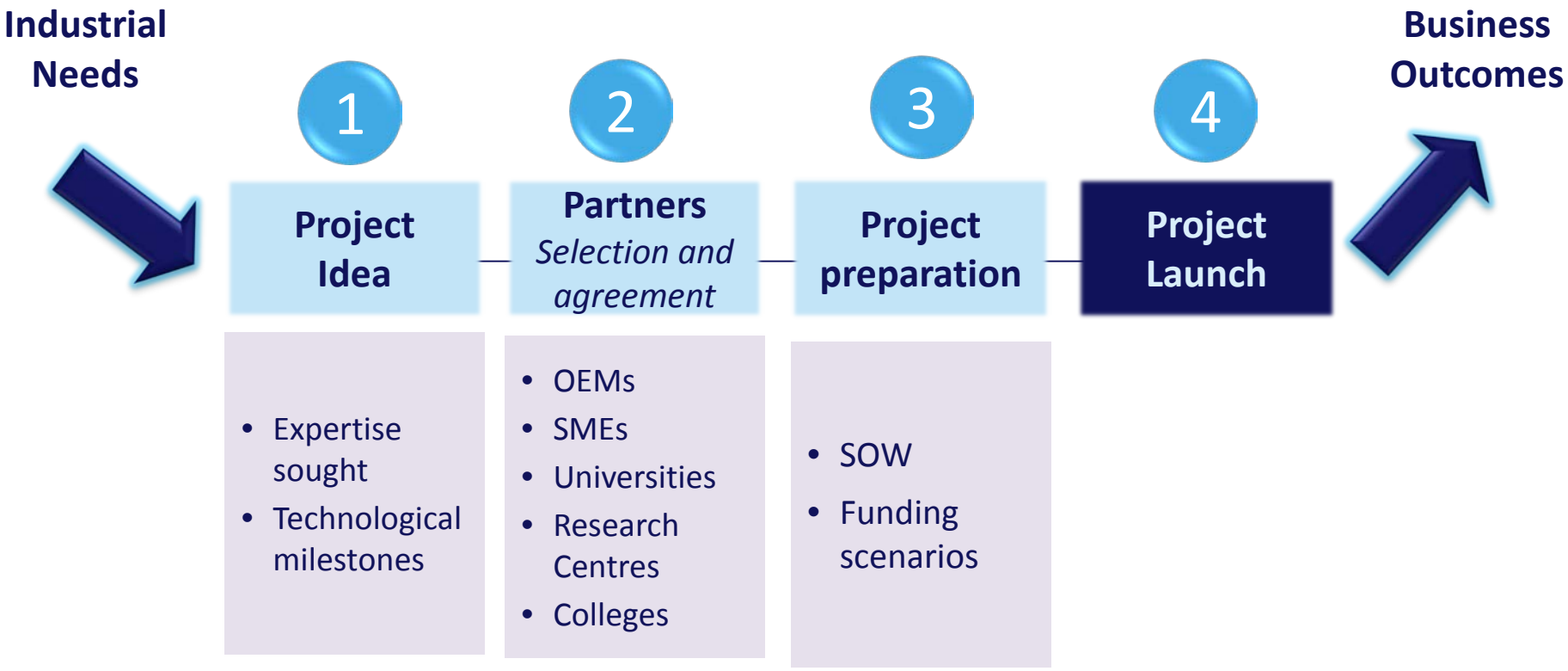
Project Launch Process



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CARIC Collaborative Projects

	Low TRL – Understanding Technology	Mid TRL – Maturing Technology
		
Partnership	2 industrial partners + 2 academic partners	
Stacking limit	75%	
CARIC funding	max. 10% of eligible project expenditures	max. 50% of eligible project expenditures
Funding recipients	Universities or colleges delivered	Industries delivered

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Funding Scenarios

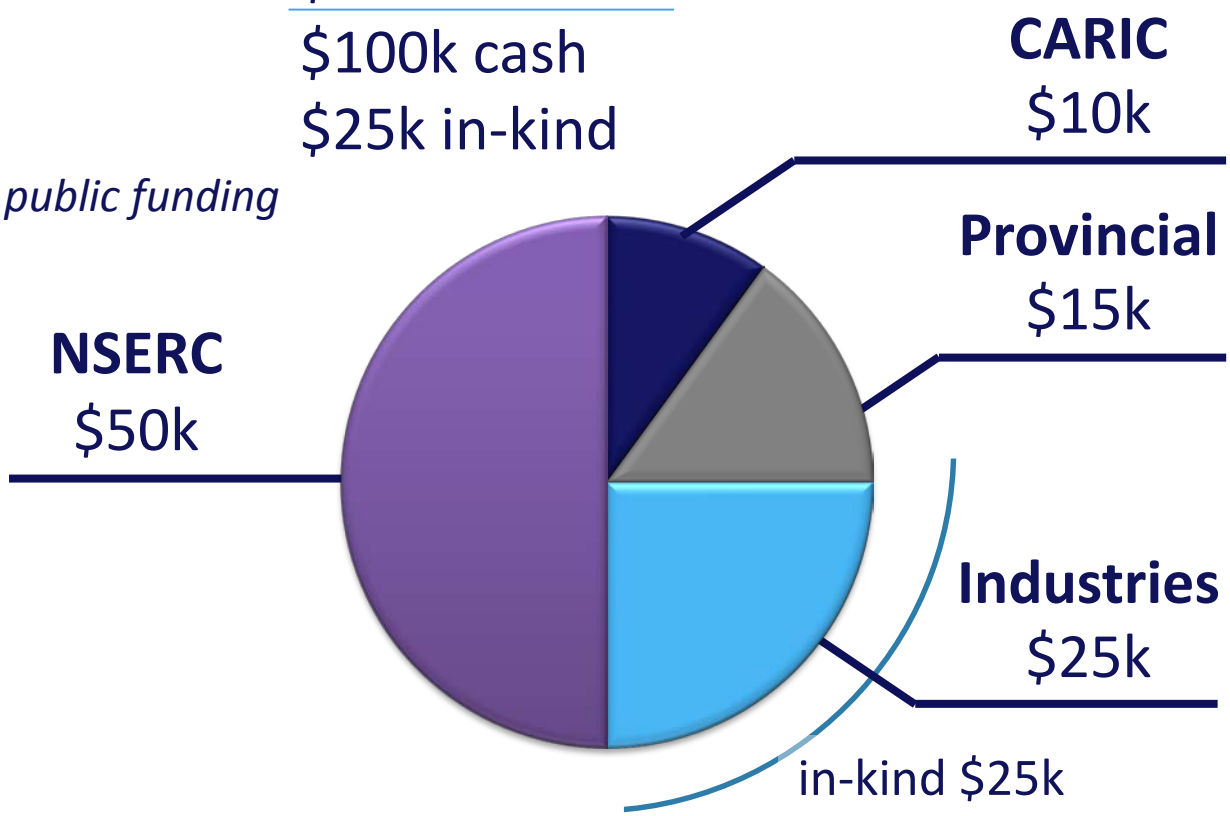
Low TRL-Projects – *Provincial Funding*

Total Project Value: $125k

$100k cash

$25k in-kind

Max. 75% in public funding



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Funding Scenarios

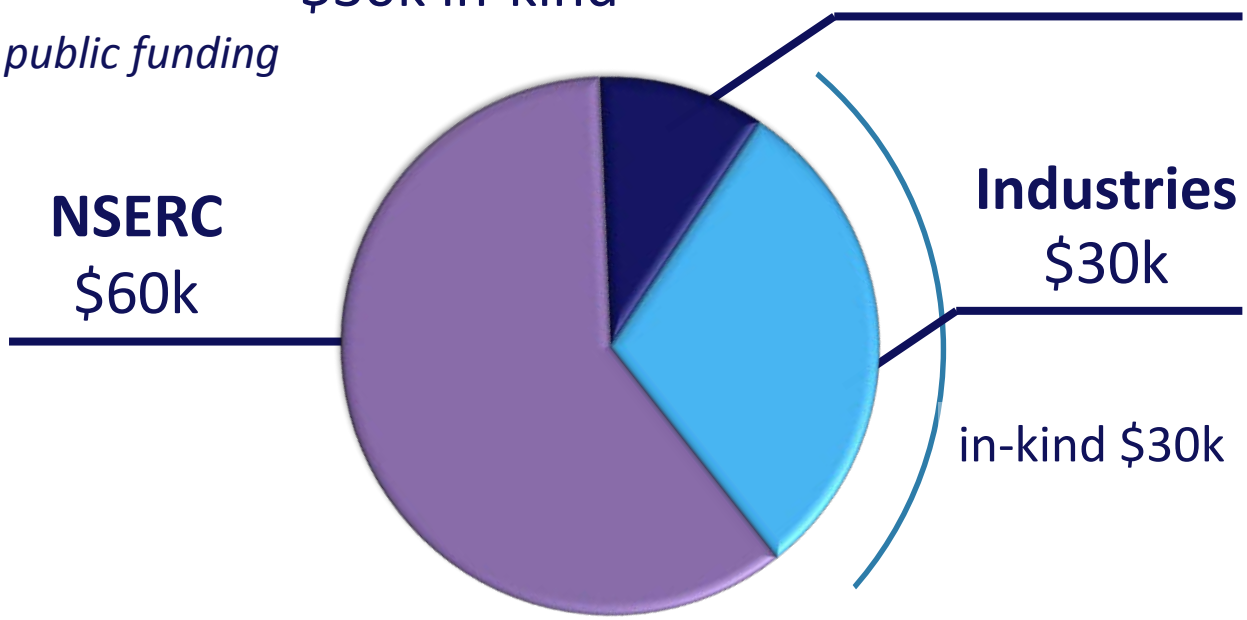
Low TRL-Projects – *No Provincial Funding*

Total Project Value: $130k

$100k cash

$30k in-kind

Max. 75% in public funding



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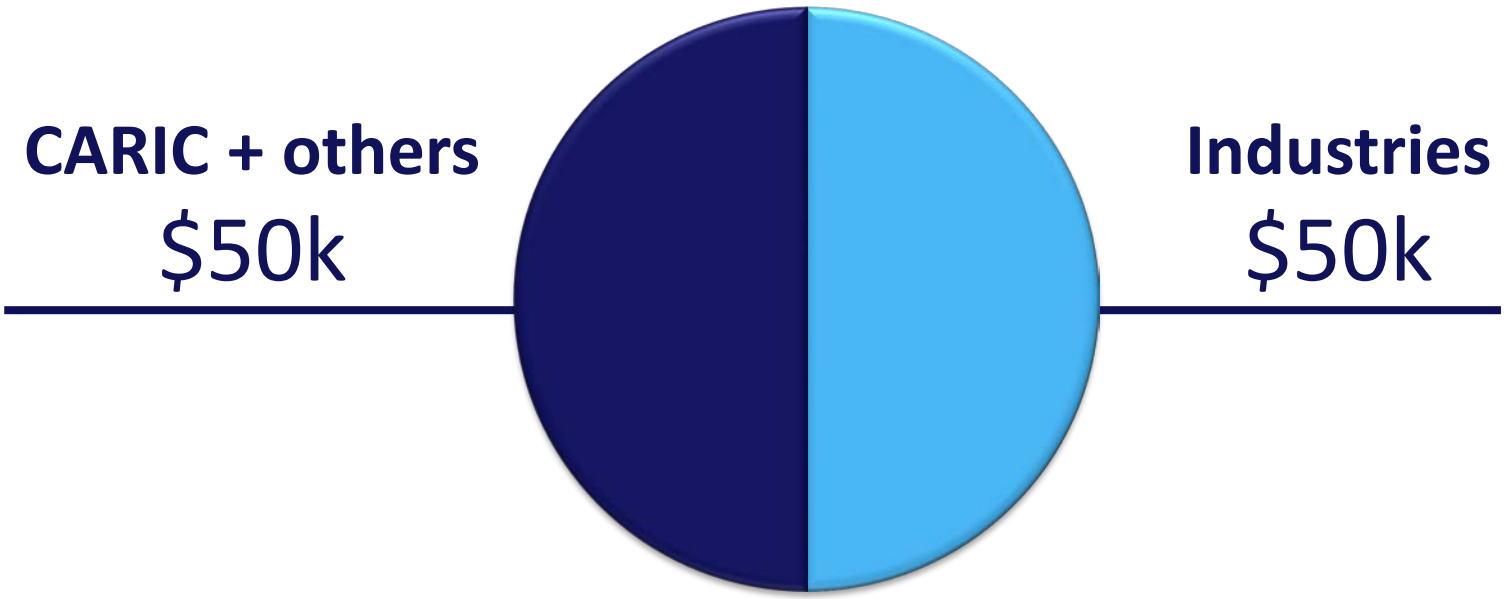
Funding Scenarios

Mid TRL-Projects

Total Project Value: $100k (cash + in-kind)



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Canada-EU Collaboration (2015)

Areas of common interest :

1. Reducing environmental impact through advanced design of novel aircraft configurations
2. Reducing engine and airframe noise through improved design or novel materials applications
3. Resource-efficient high-performance development of materials and manufacturing processes
4. Reducing energy consumption through more electrical aircraft and highly integrated systems

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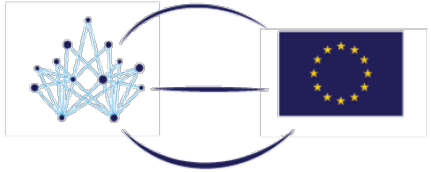
Canada-European Union Collaborations

	 **Canada-European Union Coordinated Call**
Partnership (TRL 2-4)	**Canada:** minimum **2** industrial + **2** academic partners **EU:** minimum **3** independent organizations from **3** different EU member states
Stacking limit	75%
CARIC funding	up to **50%** of the Canadian side's eligible expenditures
Funding destination	Academic and industrial

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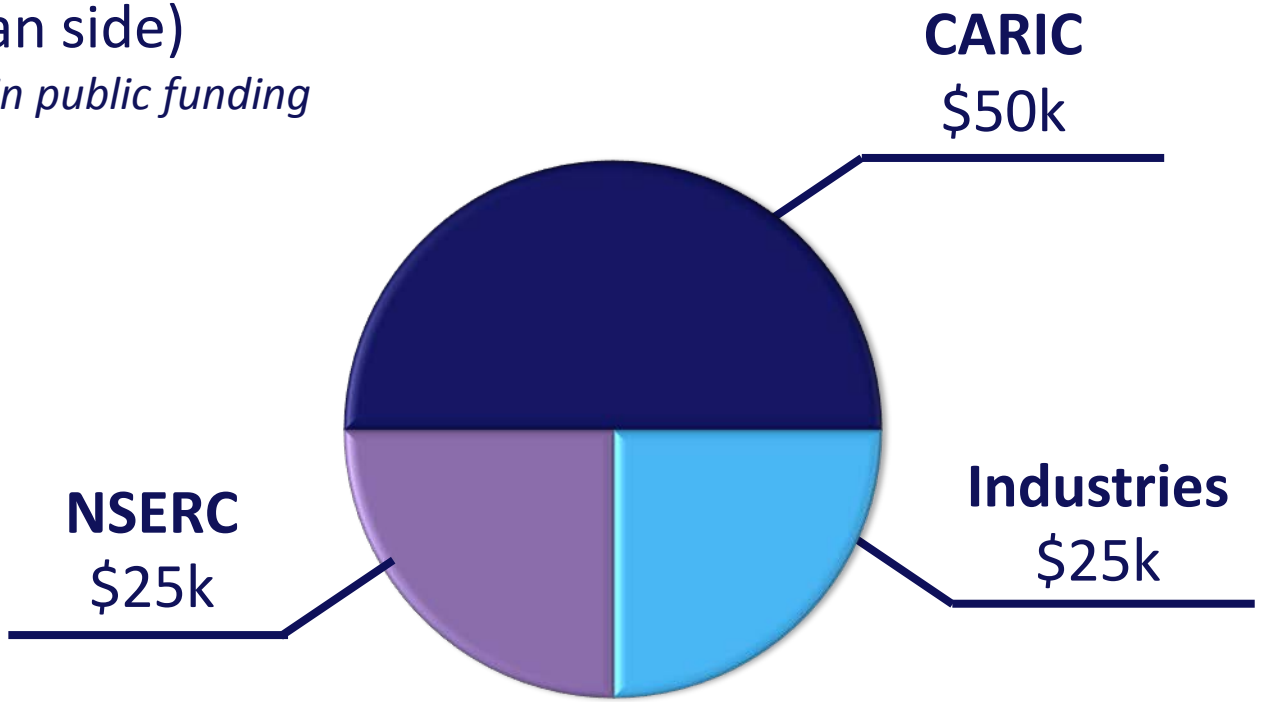
Funding Scenarios
Canada-EU Collaboration

Project Value: $100k (cash + in-kind)
(Canadian side)
Max. 75% in public funding



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CARIC Agenda
Important dates

- December 11, 2014: Webinar
- Winter 2015: Workshop tour
  - *-Montreal: January 20, 2015*
  - *-Toronto: January 22, 2015*
  - *-Winnipeg: February 3*
  - *-Vancouver: February 5, 2015*
  - *-Halifax: TBC*
- April 23, 2015 : Canada-EU Collaboration Full proposal submission

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Conclusion

- Collaboration and mobilisation are the keys to consolidate Canada's competitiveness…

…and CARIC is the tool enabling it.

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