Digital Innovation in Clean Energy (DICE) 2.0 Open Competition

Program Webinar

Bruce Duong, Senior Manager, Digital and Recovery Technologies

October 28, 2021

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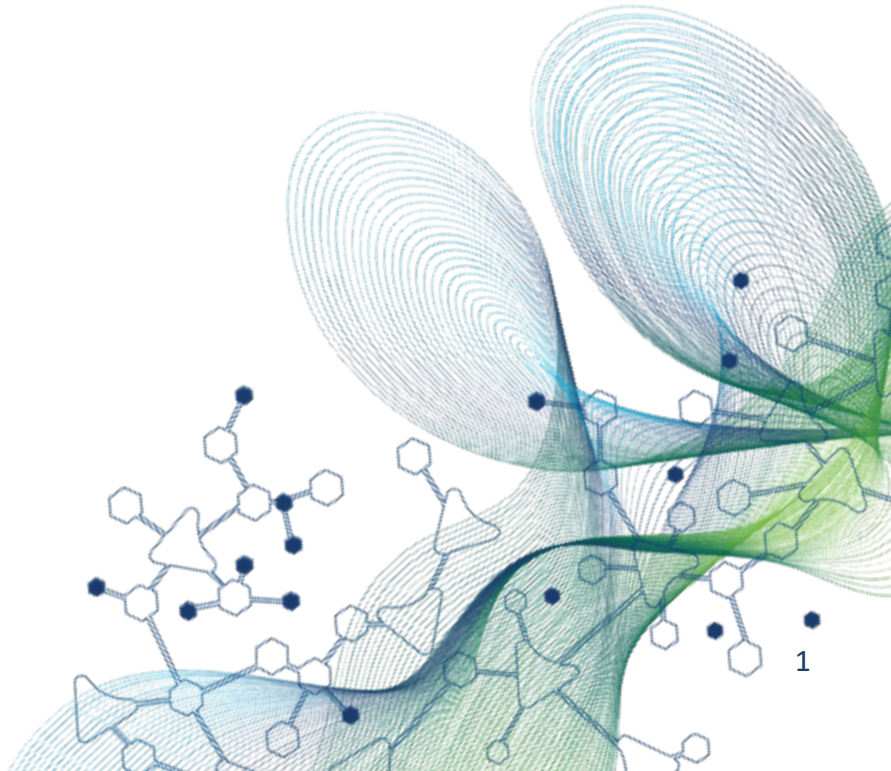

Agenda

1. Housekeeping
2. Alberta Innovates Background
3. Digital Innovation in Clean Energy 2.0
4. Project Targets and Considerations
5. Applicant Eligibility
6. Submission Process
7. FAQs
8. Q&A

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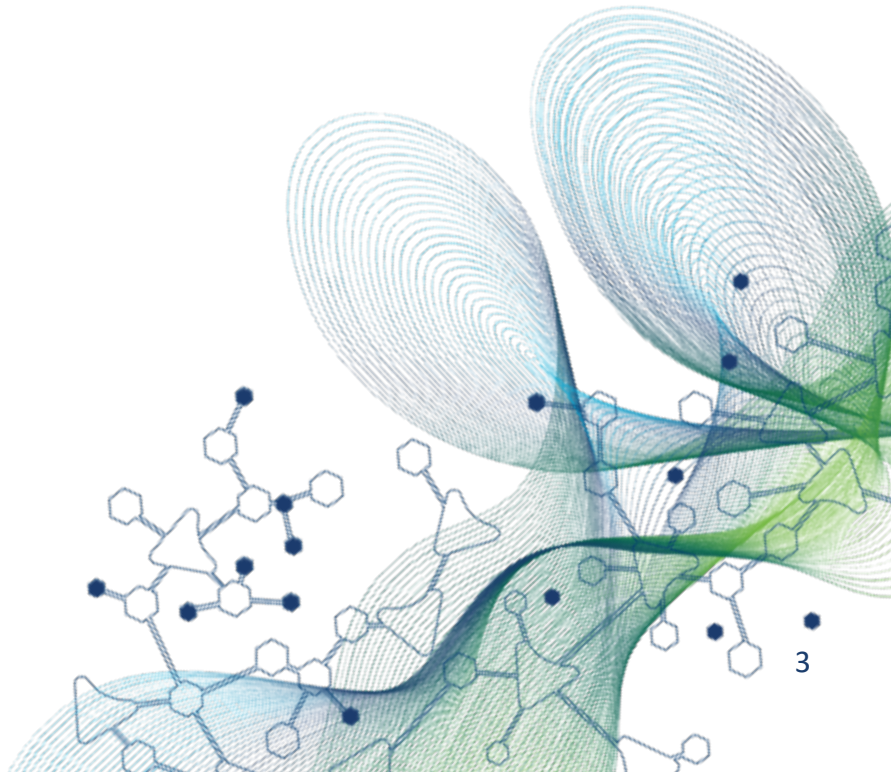
Housekeeping

The presentation and Q&A will be recorded and posted on the DICE program website within 24 hours of the end of the webinar.

- Microphones are muted, you are only able to listen to the audio and view the presentation.
- All questions are typed in the message box, directly under the “ask the moderator” section.
- Please ask your questions or vote up questions that may be repeated.
- Questions will be answered and recorded in the Q&A portion of the presentation.



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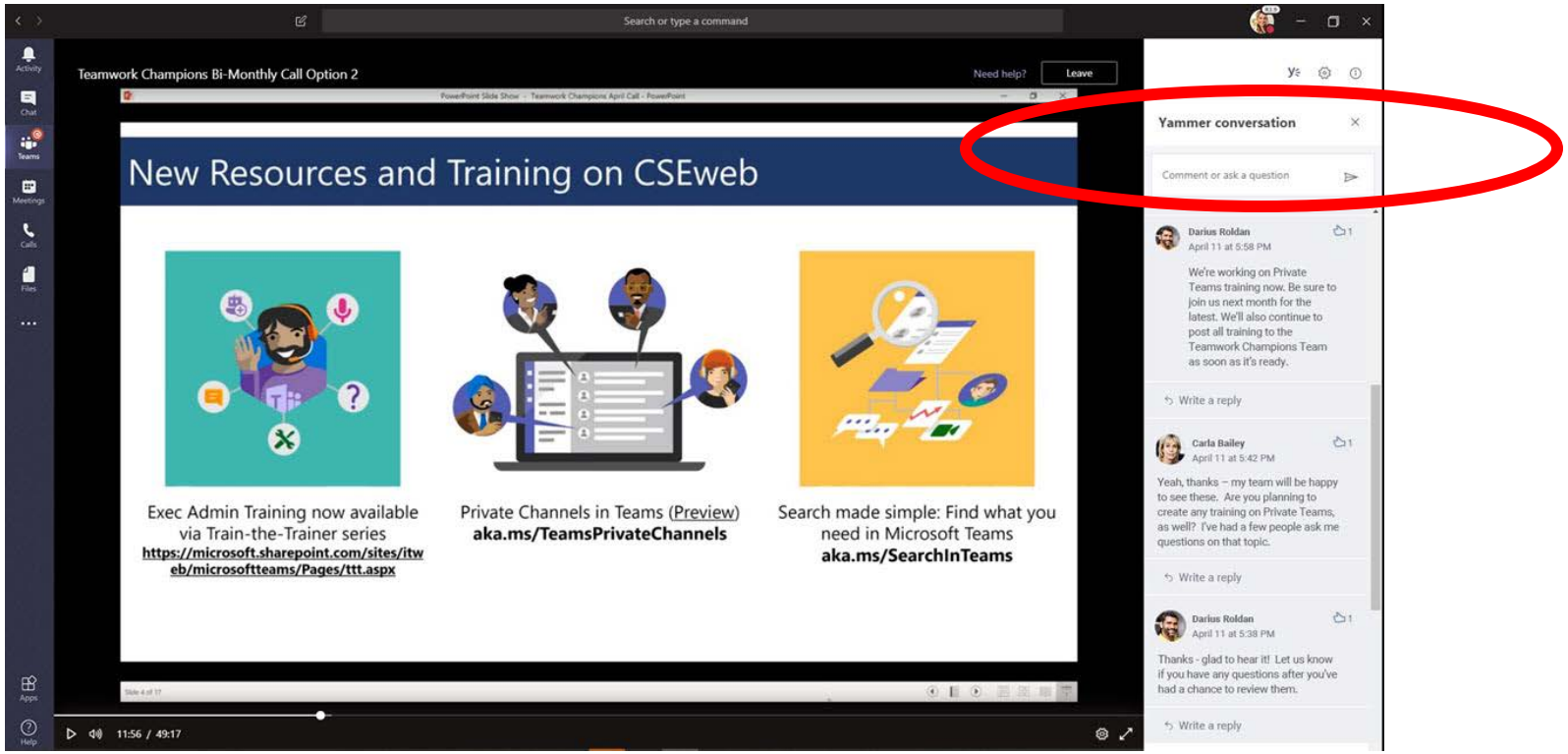

- Click on the message box located at the top right corner and type in your question
- Hit enter or arrow icon to send question

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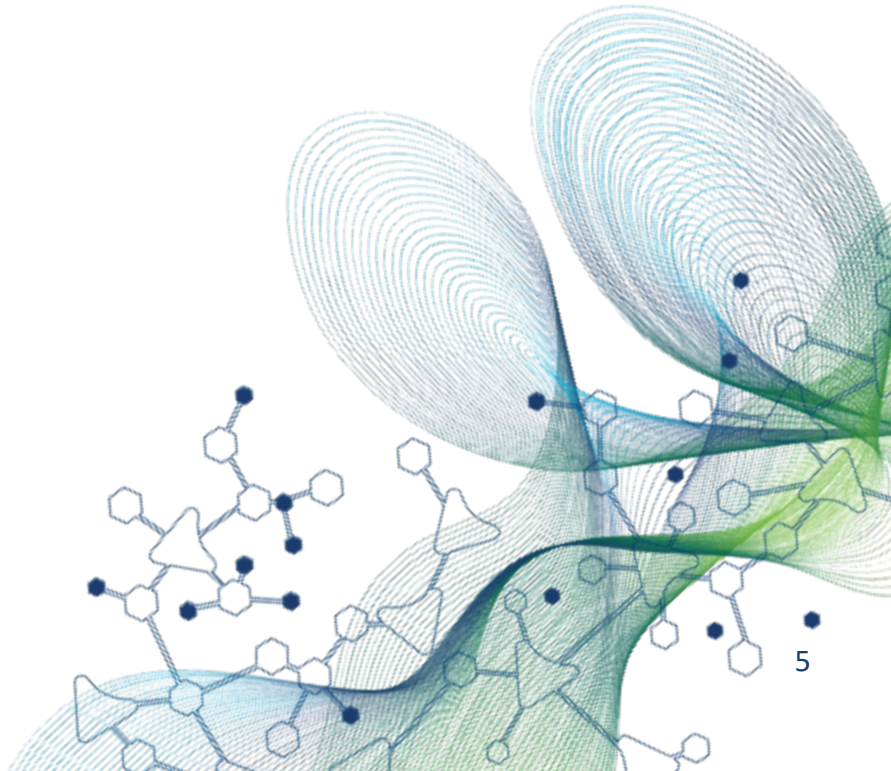
Land Acknowledgement

We acknowledge the many First Nations, Métis and Inuit who have lived in and cared for these lands for generations. We are grateful for the traditional Knowledge Keepers and Elders who are still with us today and those who have gone before us. Alberta Innovates respectfully acknowledges that we are situated on traditional territory of the Treaty 6, Treaty 7, and Treaty 8 First Nations; home to Métis Settlements, the Métis Nation of Alberta, and Regions 2, 3 and 4 within the historical Northwest Métis Homeland. We respect the histories, languages, and cultures of First Nations, Métis, and Inuit whose presence continues to enrich our vibrant community.



Equity – Diversity – Inclusivity

We believe the Alberta Research and Innovation (R&I) ecosystem is stronger and more sustainable when it is broadly representative of the overall diversity of our community.

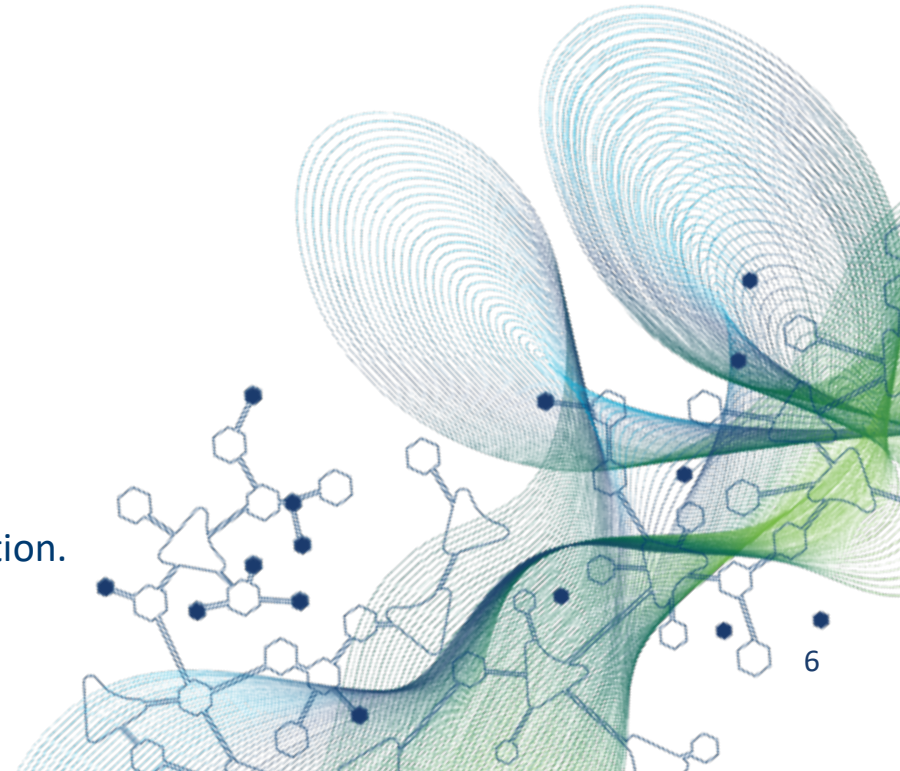
We strive to ensure that all interested and qualified parties have an equitable opportunity to participate and contribute to the ecosystem and that our processes are inclusive.

Historically, there have been several groups/populations that have been under-represented in the R&I landscape including:

- Women entrepreneurs/researchers
- Indigenous entrepreneurs/researchers
- Remote/small community entrepreneurs/researchers
- New immigrant entrepreneurs/researchers

We encourage ALL entrepreneurs/researchers to apply!

If you are a first time AI applicant, don't hesitate to reach out for navigation information.



Alberta Innovates at a Glance

2
Subsidiaries
C-FER Technologies
Innotech Alberta

Investment
of $189 million
for 2020–21

558
Employees
Alberta Innovates 219
C-FER 99
InnoTech Alberta 240

11
Locations

"Alberta's research and innovation engine, solving problems, creating possibilities"

Our Focus
Core Emerging Technology Areas

Data-Enabled Innovation

Transforming data into actionable infomation enables digital transformation.

Digital Technology for Business Transformation

How we leverage technology to sense and measure information across enterprises is changing the way we live and conduct business.

Clean Technology

The sustainability of our planet necessitates innovation for a low carbon future.

Innovation Production & Distribution

In a globalized economy, product innovation and access to market and access to market is critical to competitiveness and continued prosperity.

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Our Focus
Clean Resources

Clean Resources

- Advanced Hydrocarbons
- Clean Technology
- Environmental Innovation
- Bio-Industrial Materials
- Smart Agriculture and Food

Aligned Priorities

- GHG (CCUS, CH4, etc.)
- Water
- Land
- Tailings
- Wellsite Reclamation
- Biodiversity

Continuous Intake

Open Targeted Calls

Alberta Research & Innovation Framework 2030 Targets

45%

reduction in methane emissions by 2025

30%

electricity from renewables

20%

reduction in landscape disturbance, accelerated reclamation

30%

increase in water efficiency and safe, secure water

$40 billion

Alberta's manufacturing output

50%

per barrel decrease in fresh water use and GHG emissions

25%

increase in value of oil and gas exports

Biodiversity

maintained or enhanced

25%

revenue increase in cleantech

$20 billion

Alberta's digital economy

Digital Innovation in Clean Energy (DICE)

Program Objectives

- Advancing technologies that benefit Alberta industry or public sector
- Funding novel technologies with the potential to achieve clean energy impacts, economic diversification, and employment opportunities
- Recruiting and developing highly skilled personnel to support the digital economy in Alberta

Overarching Alberta Research Innovation Framework Targets

- A 35% revenue increase in cleantech
- A $40 billion increase in manufacturing output
- A $20 billion digital economy in Alberta

Digital Innovation in Clean Energy (DICE)

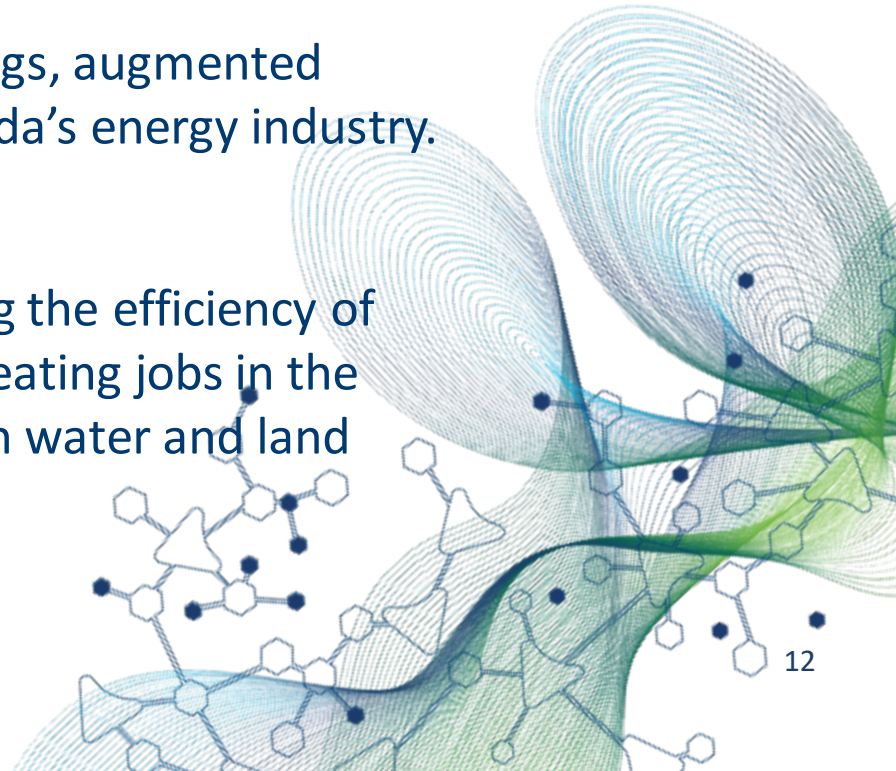
Alberta Innovates is announcing a new round of funding under its Digital Innovation in Clean Energy (DICE) program. $2.5 million in funding from Alberta Innovates is available, with up to $350,000 available per project.

DICE funds the development of:

- Artificial intelligence, machine learning, industrial internet of things, augmented reality, and unmanned aerial vehicle technologies for use in Canada's energy industry.

DICE projects will:

- Develop technologies and accelerate them into market, improving the efficiency of energy production, reducing greenhouse gas (GHG) emissions, creating jobs in the digital economy, and contributing to environmental innovations in water and land management.

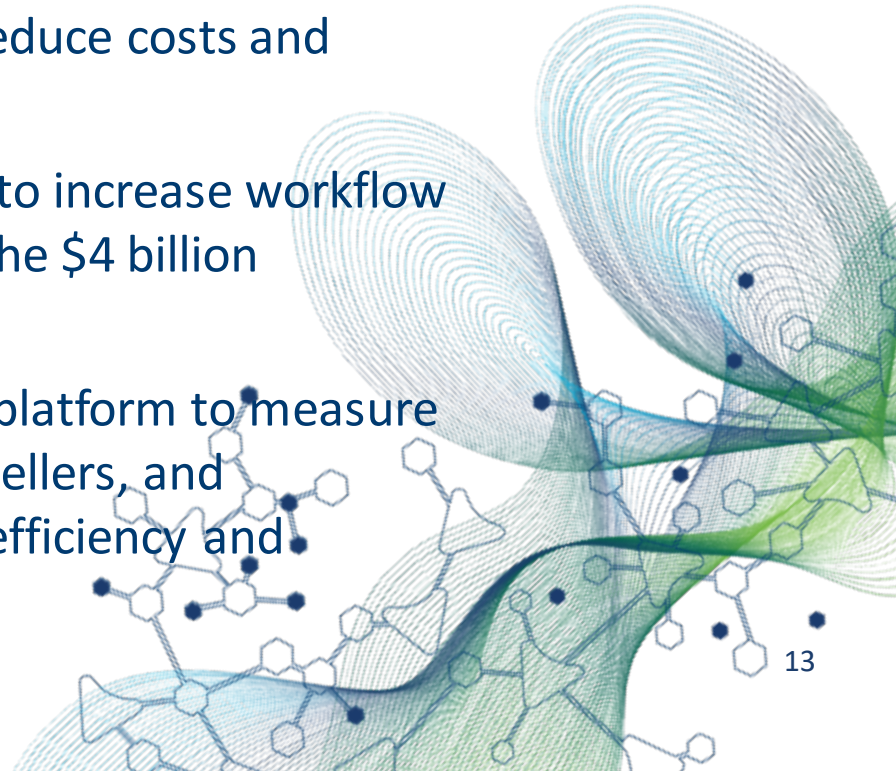


Digital Innovation in Clean Energy (DICE)

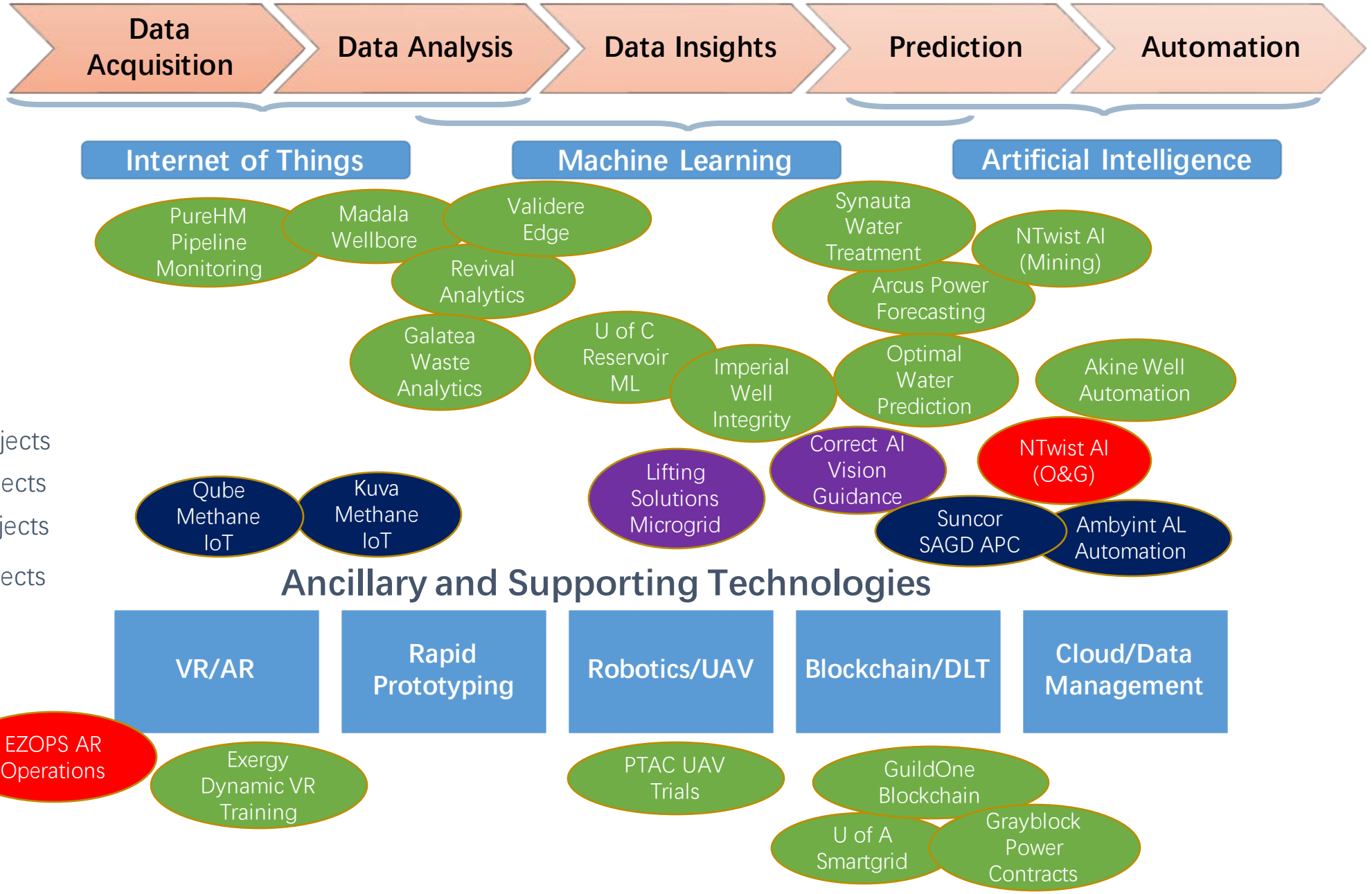
A new round of funding complements the investment provided to the first DICE projects in 2020, where 17 projects supported by $3 million in DICE funding created $16 million in project value.

Examples of previously funded projects in DICE include:

- Edmonton-based NTWIST is applying artificial intelligence for industrial process optimization and automation to help major resource producers reduce costs and environmental impacts. Full story here.
- Galatea Technologies is creating a “Waste Coordinator” platform to increase workflow transparency, cost accuracy and provide actionable insights into the $4 billion Canadian waste disposal market. Full story here.
- Validere is using advanced analytics and machine learning based platform to measure emission reductions and produce actionable insights for buyers, sellers, and transporters of petroleum products, while improving operations efficiency and trading profits. Full story here.



Current and Completed Projects



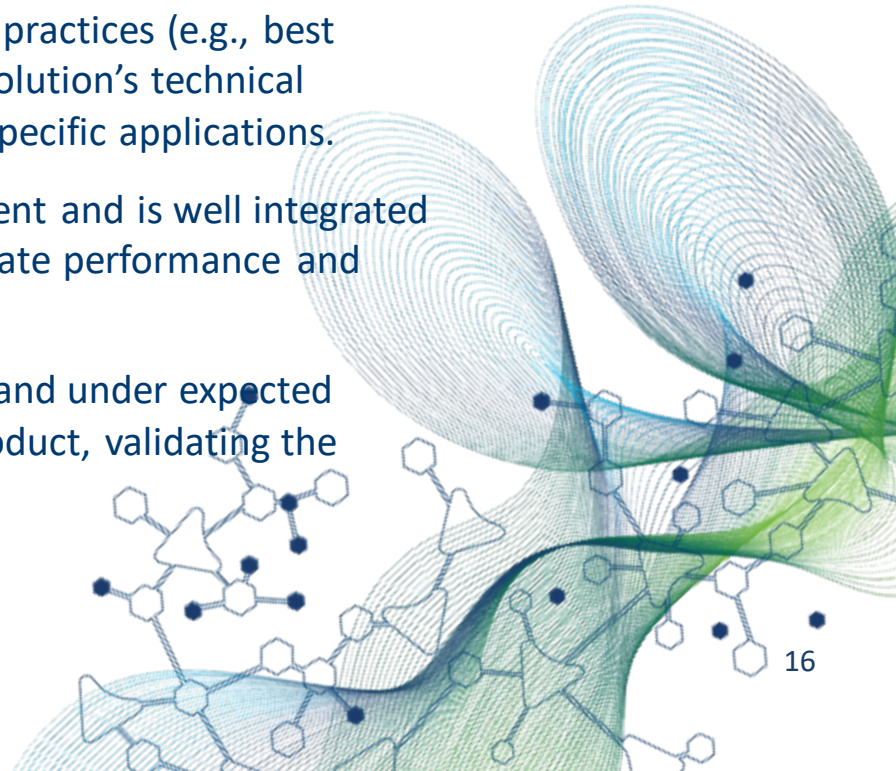
DICE 2.0 Timeline

Date	Planned Activity (dates subject to change at AI's discretion)
October 21, 2021	Launch of open call
October 28, 2021	Webinar (via videoconference)
December 22, 2021	Close of proposal submissions 3:00 PM MST
February 25, 2022	Announcement of funded projects
August 31, 2023	Latest completion date for funded projects

Project Targets and Considerations

Proposed solutions should be within a TSRL range of 3-7 at the beginning of the project

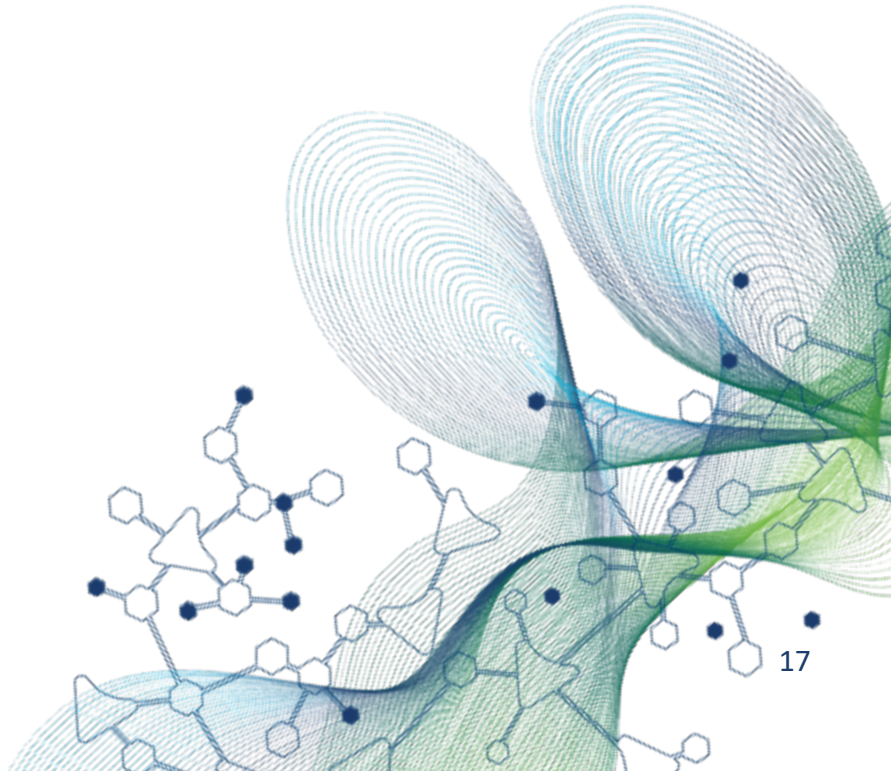
- **TSRL 1-3: Research and solution validation**: Research is primarily done in the lab and ranges from fundamental research to proof of concept in a lab setting. Theory and scientific principles are focused on knowledge and application to define the concept. A potential business model is outlined, with problem and solution validation required. A market and competitive analysis is performed to align the proposed solution with the market need.
- **TSRL 4-6: Development**: The basic technological components are integrated for testing in a simulated environment and include alpha testing of prototypes. Knowledge and operational practices (e.g., best management practices) are tested at small scales in the field. A roadmap for the solution's technical requirements is developed to complete a demonstration of design prototypes in specific applications.
- **TSRL 7: Field Pilot:** The prototype is tested in the field in an operational environment and is well integrated with other systems. The proposed solution package is tested by end-users to validate performance and integration.
- **TSRL 8-9: Demonstration:** The technology is scaled up and tested in its final form and under expected conditions. The solution has been developed to the stage of a minimum viable product, validating the proposed business model and confirming market applicability.



Project Targets and Considerations

Development of project technologies should be able to either show direct measurable benefits or to reasonably quantify enabled/indirect benefits in at least one of the following areas:

- Cost reduction
- Increasing competitiveness
- Development of HQP
- GHG emission reductions
- Water, land environmental impacts; clean air, water, and soil
- Company creation and new product development
- Economic diversification



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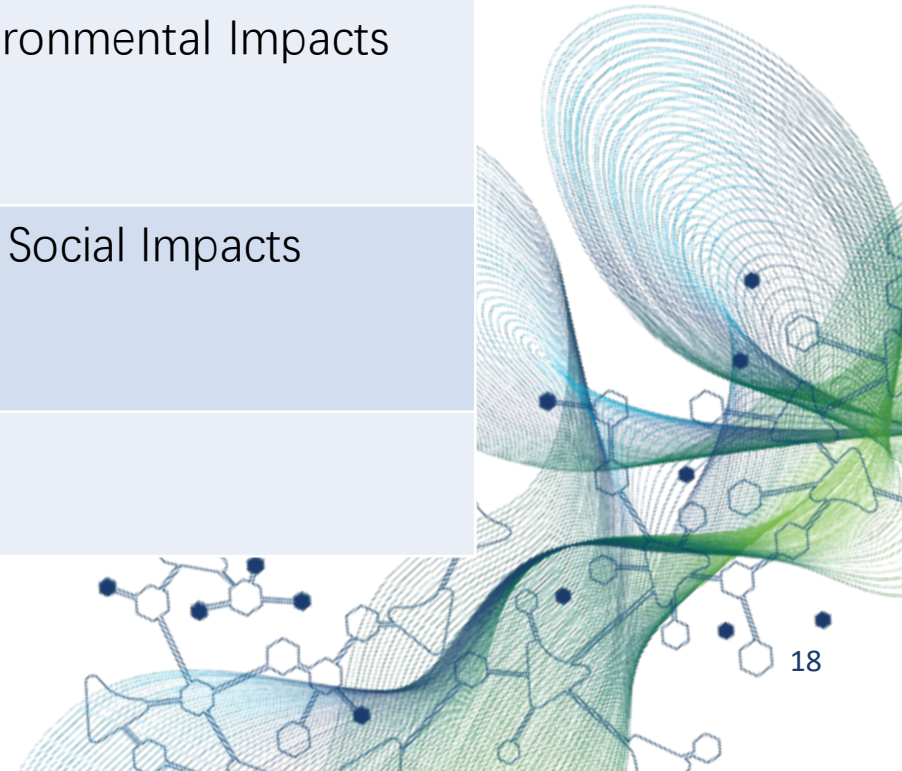
Project Targets and Considerations

Proposal Application Evaluation Criteria

The Innovation	Project Management	Impacts and Outcomes
Innovation Opportunity	Work Plan, Tasks, and Deliverables	Economic Impacts to Alberta
Market Opportunity and Competitive Analysis	Budget and Funding Commitment	Environmental Impacts
Proposed Commercialization Pathway	Project Team	Social Impacts
	Risk Analysis and Mitigation	



Project Targets and Considerations

Examples of potential projects

Product yield optimization and production efficiency

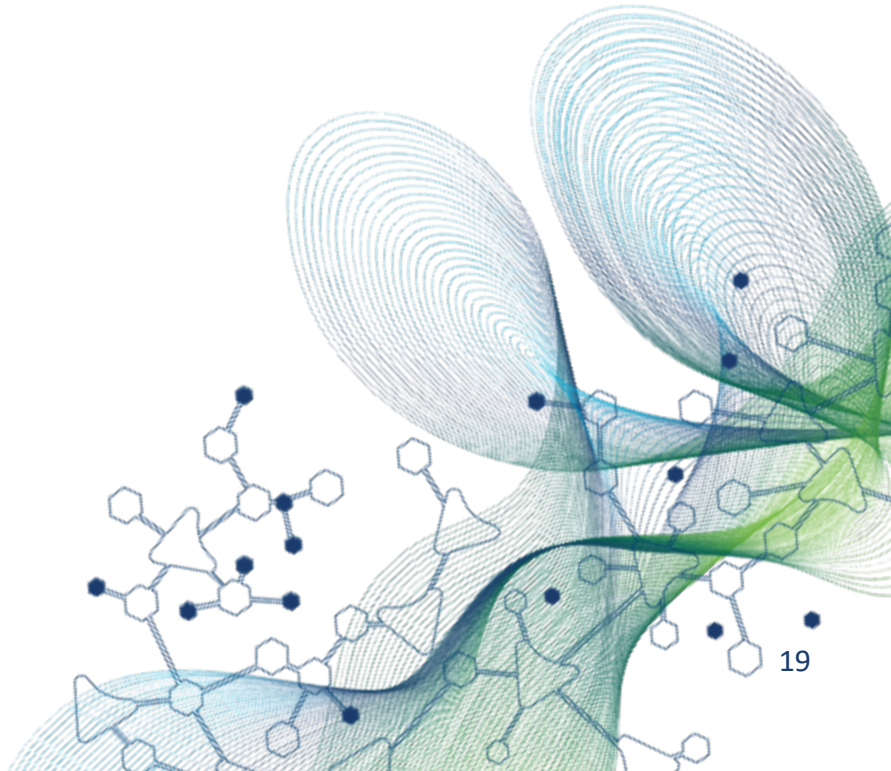
- Downhole/surface IoT data acquisition and control
- Artificial lift operation, pipeline operation automation
- Enhanced seismic data acquisition, real time reservoir history match
- Real time 3D imaging, fracturing optimization, reservoir optimization

Value creation and operational efficiency

- Scenario modeling, arbitrage, trading, product value realization
- Smart contracts, project execution optimization
- Simulation, production planning, projections

Automation

- IoT sensors, edge controllers; automated optimization
- UAVs and LIDAR, mapping and satellite technology
- Self-driving haulers, autonomous mining, autonomous transportation



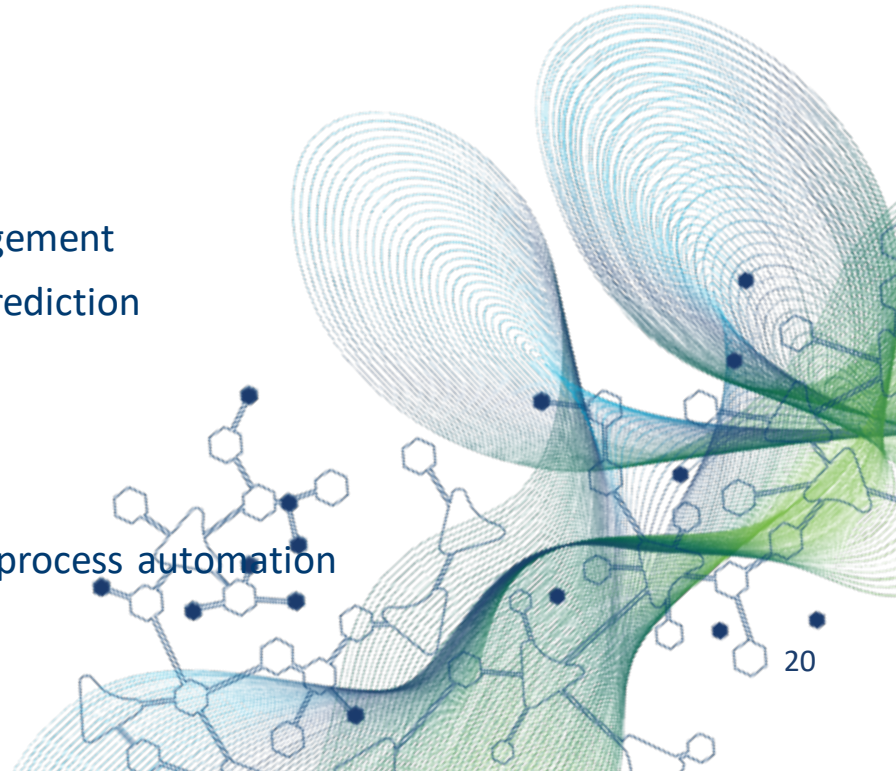
Project Targets and Considerations

Examples of potential projects

Project execution and predictive maintenance

- Shutdown reduction, integrity issue avoidance
- VR/AR/visualization - digital twins and project execution
- IoT sensor analogs, computer vision, cameras
- Integration with existing operational data; SCADA, fluid samples etc.
- Innovative data collection technologies

- General digital technologies
  - Development of innovative hardware for data collection, analysis and management
  - Development of innovative software for data analytics, interpretation and prediction
  - Development of innovative predictive models
  - Development of innovative data workflows using existing data sources
  - Application of machine learning to specific data sets
  - Development of new ML/AI workflows, implementation of AI workflows for process automation



Project Targets and Considerations

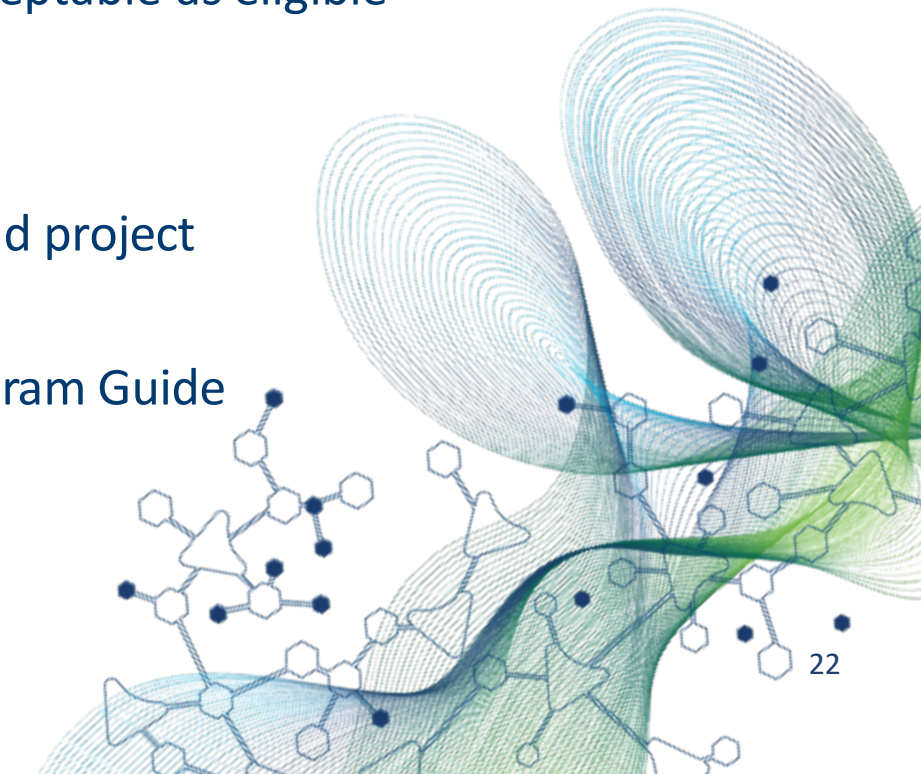
Clean Resources Focus Areas

Advanced Hydrocarbons	Clean Technology	Environmental Innovation
Production optimization and yield improvements	Smartgrid, distributed generation, and renewable energy management and control	Water treatment and management
Operational efficiency improvements, improved economic efficiencies	Integration of energy storage and renewable energy	Land and biodiversity monitoring
Integrated operations solutions	Innovations related to contracts and settlements	Tailings management
Emissions reductions and environmental performance	Transportation system management and control	Management of environmental monitoring and public health
Project execution, operational health and safety	Green buildings technologies	

Applicant Eligibility

Project funding can be up to, but not exceeding $350,000 per project

- Program normally supports up to 50% of total project costs (cash plus in-kind) with the balance of funding from other project partners
- Other public funding sources (NSERC, SDTC, NRCan, etc.) are acceptable as eligible partner funding – no stacking limit with other public funding
- All projects must be completed before August 31, 2023
- Funding is dispersed on an initial project approval, milestone, and project completion basis for successful applicants
- A summary of eligible and ineligible costs is available in the Program Guide



Applicant Eligibility

Applicant is required to be one of the following:

- Alberta-based technology developer
- A researcher(s) or research team within an Alberta post-secondary institution
- A stakeholder (e.g. government research lab, consortia, end-users, etc.) with identified opportunity to develop digital energy technology for application to critical industry or public sector needs

Collaboration with other project partners is highly encouraged. Consideration will be given during the review process for projects demonstrating end user engagement and formal partnerships.

Applicant Eligibility

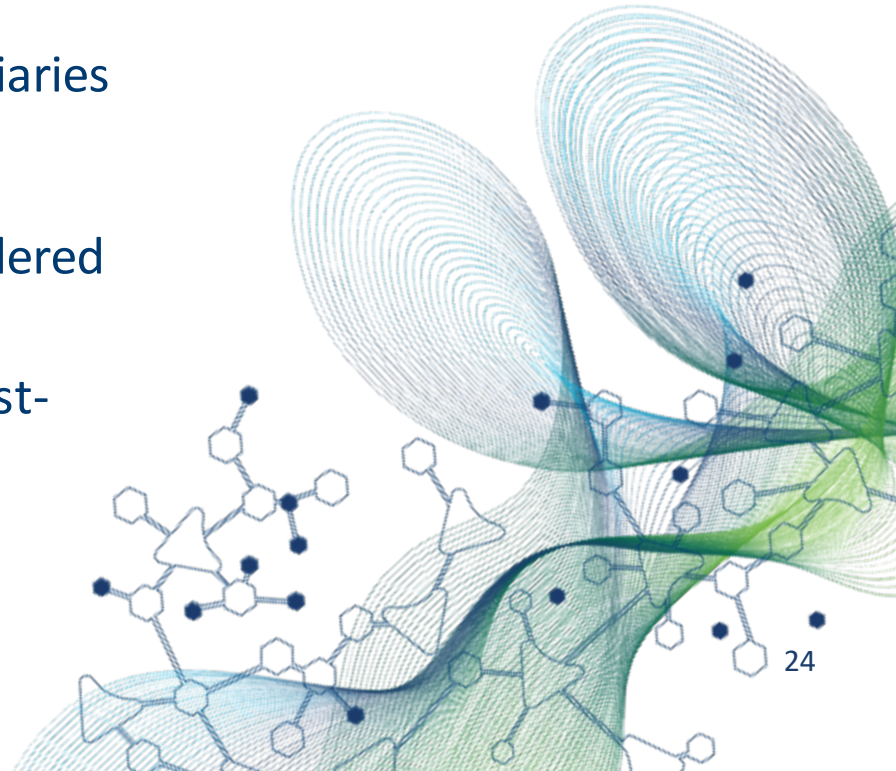
If you're not sure of your eligibility, ask!

Partner(s) is (are) required to satisfy the following criteria:

- Demonstrate a need or potential for use by Alberta Industry
- No conflict of interest between the Applicant and Partner(s)
- Have no outstanding balances to Alberta Innovates or subsidiaries

Additional Considerations:

- Federal funding agencies (e.g. NSERC, NRCan, etc.) are considered eligible project partners
- An industry partner is recommended but not required for post-secondary institution applicants



Submission Process

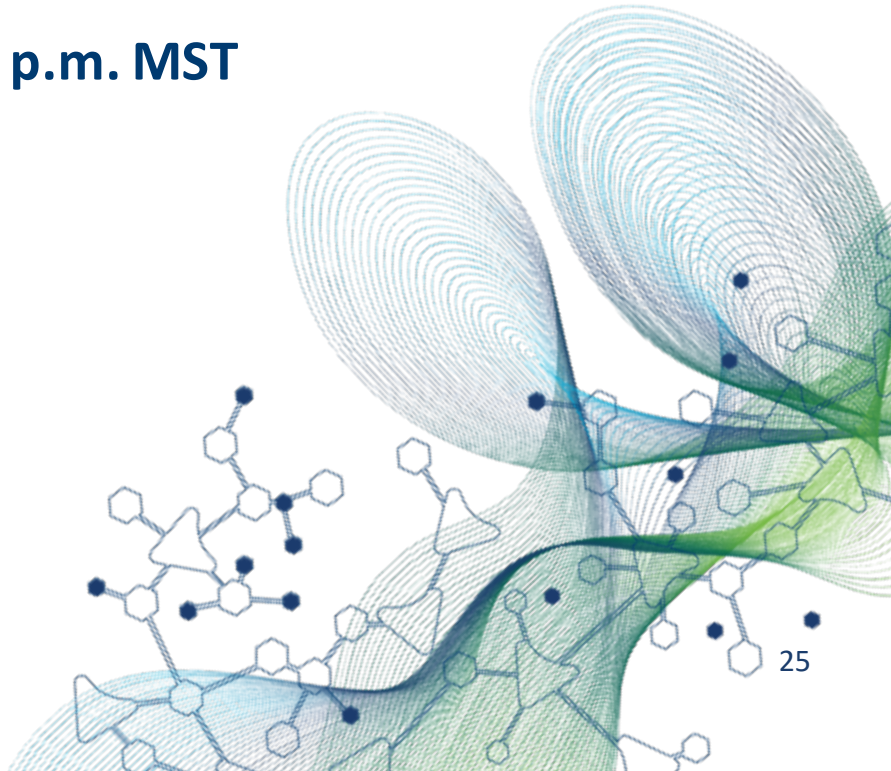
Online Portal Instructions

Step 1: Register as an applicant on SmartSimple: https://albertainnovates.smartsimple.ca

Step 2: Select the correct competition: Digital Innovation in Clean Energy : DICE 2.0 – Fall 2021

Step 3: Complete the single-stage application online, including attachments

Step 4: Submit before the deadline: **December 22, 2021: 3:00 p.m. MST**



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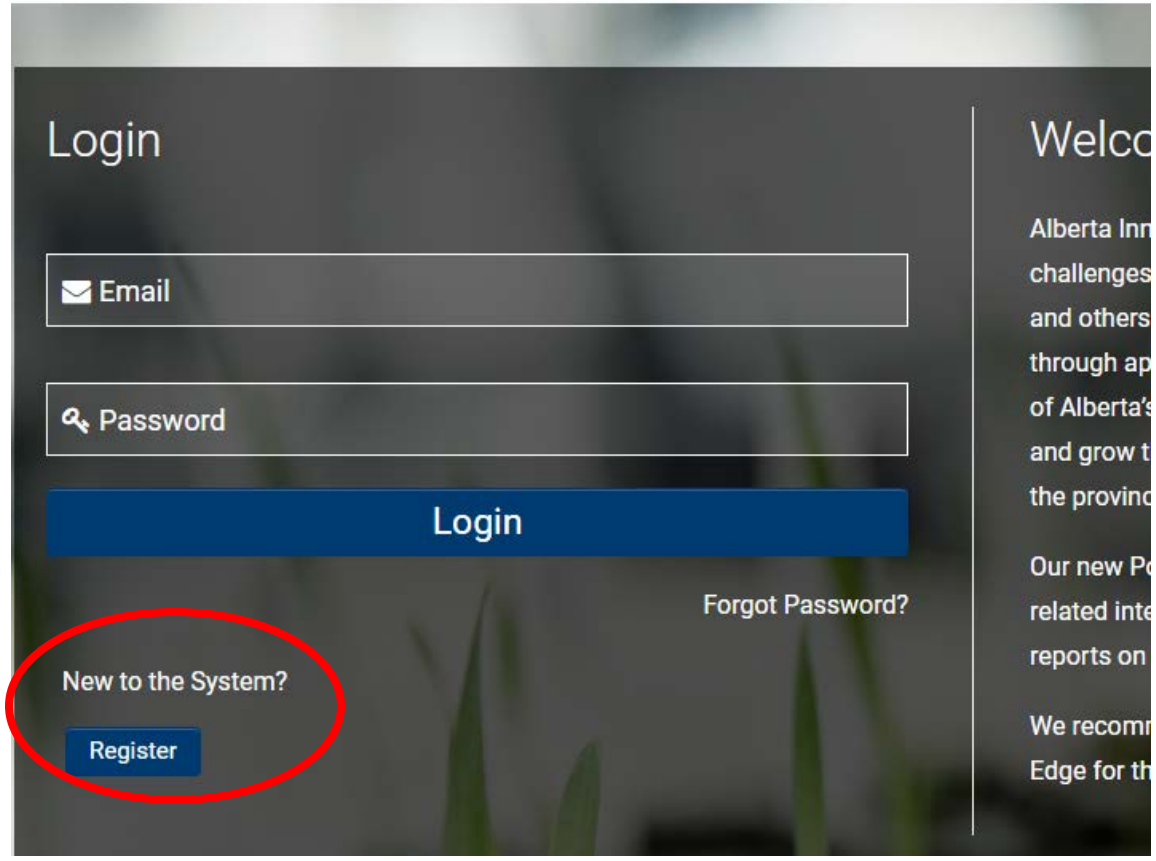

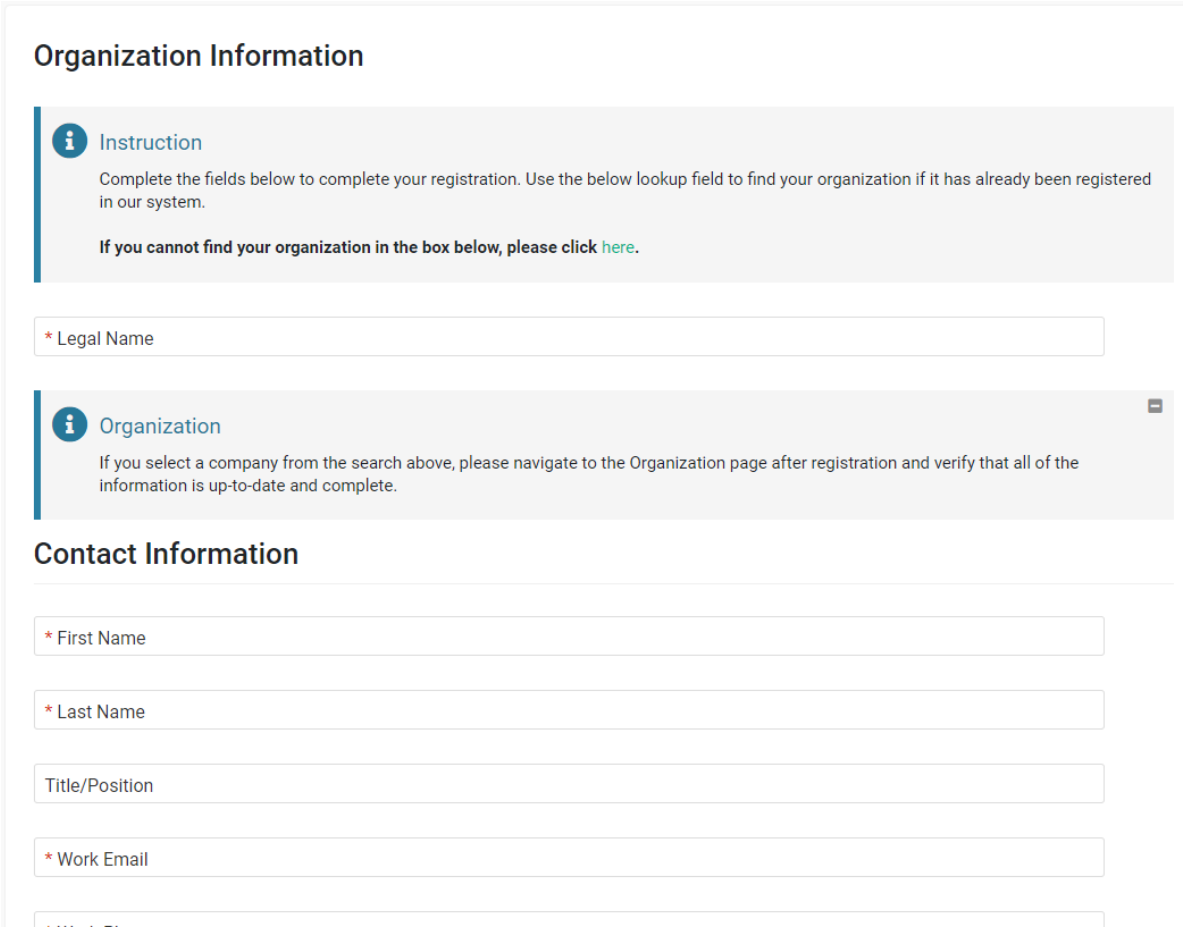

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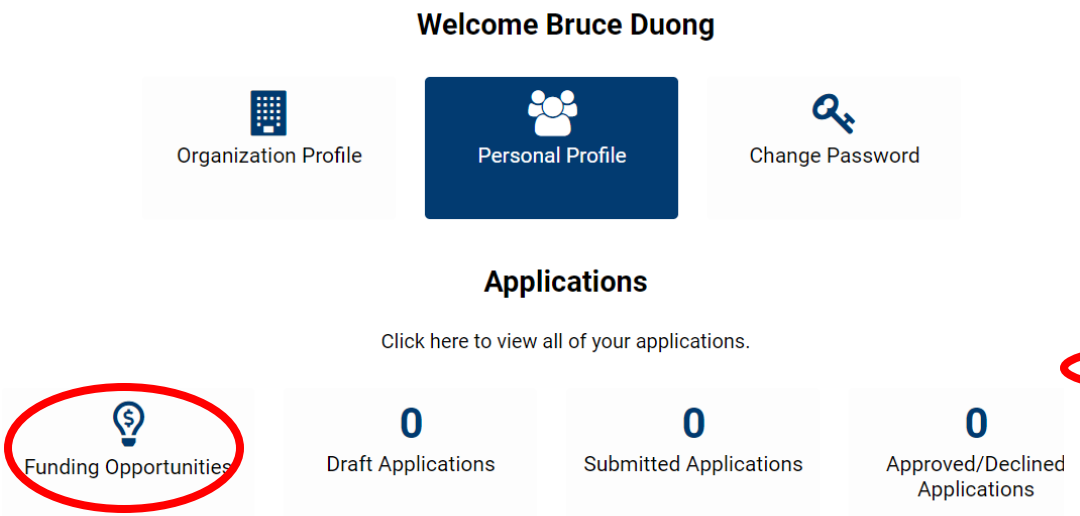

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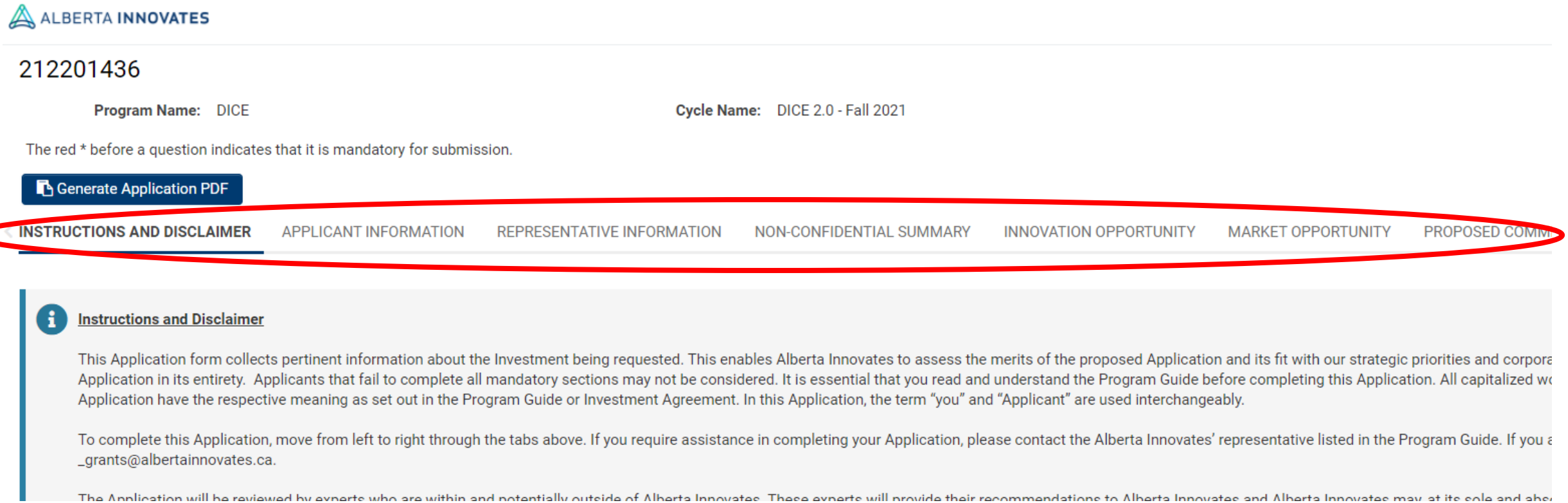

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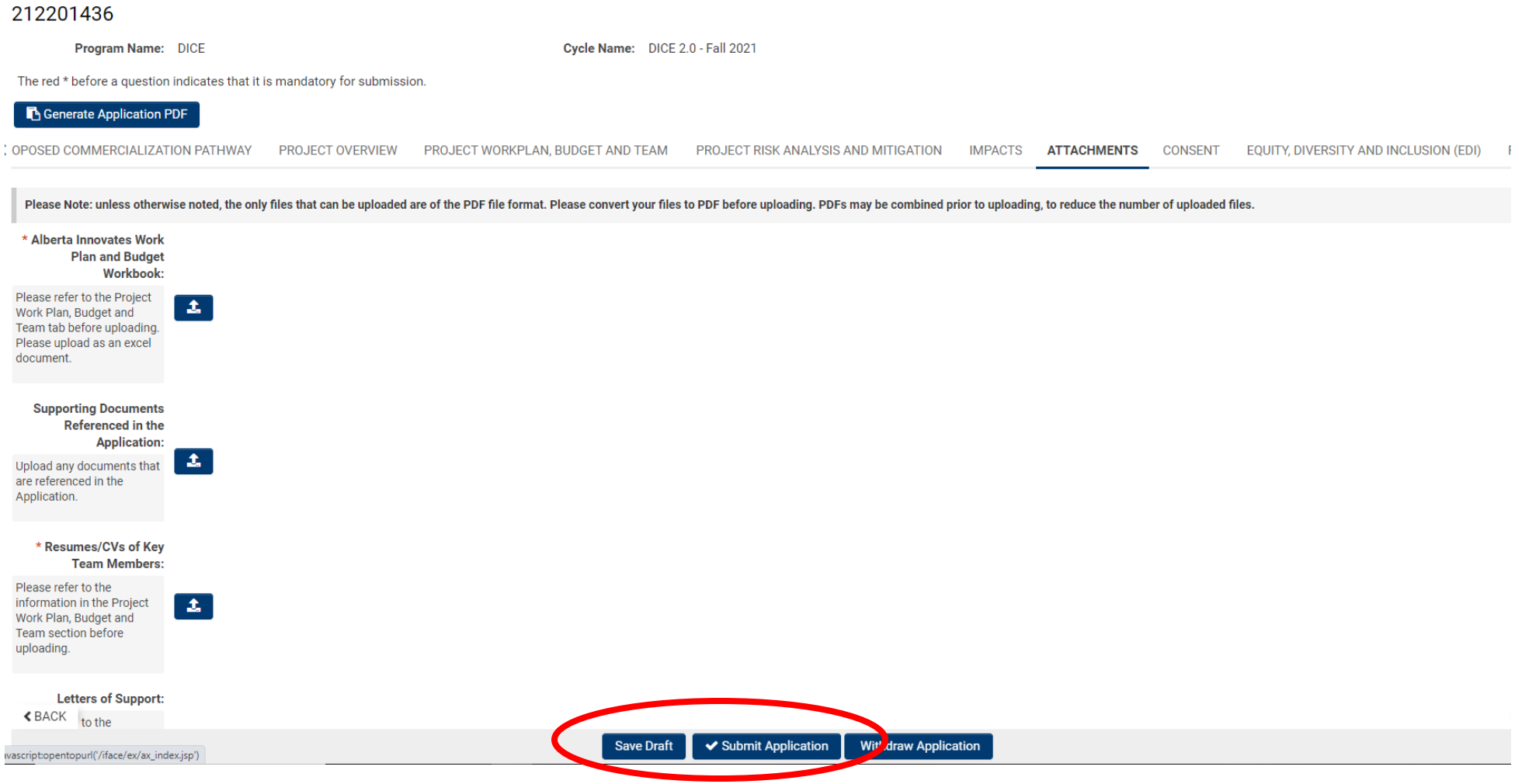

FAQ

Advice for preparing a successful submission

- Read the Program Guide
- Use clear and concise language
- Define what problem you are trying to solve
- Position your proposal relative to competing technologies
- Address each question in the application and read the question guidance carefully

- **SAVE DRAFT FREQUENTLY ON SMARTSIMPLE!**
- **DON'T WAIT UNTIL THE LAST DAY(S) TO SUBMIT!**

FAQ

- What types of organizations are eligible?
- Can projects or funding occur outside the province?
- What are examples of “industry” partners?
- What costs are eligible for matching funding?
- Is there a minimum funding request?

For additional specific questions regarding this program please contact:

Bruce Duong, Senior Manager, Recovery Technologies:
bruce.duong@albertainnovates.ca

Questions

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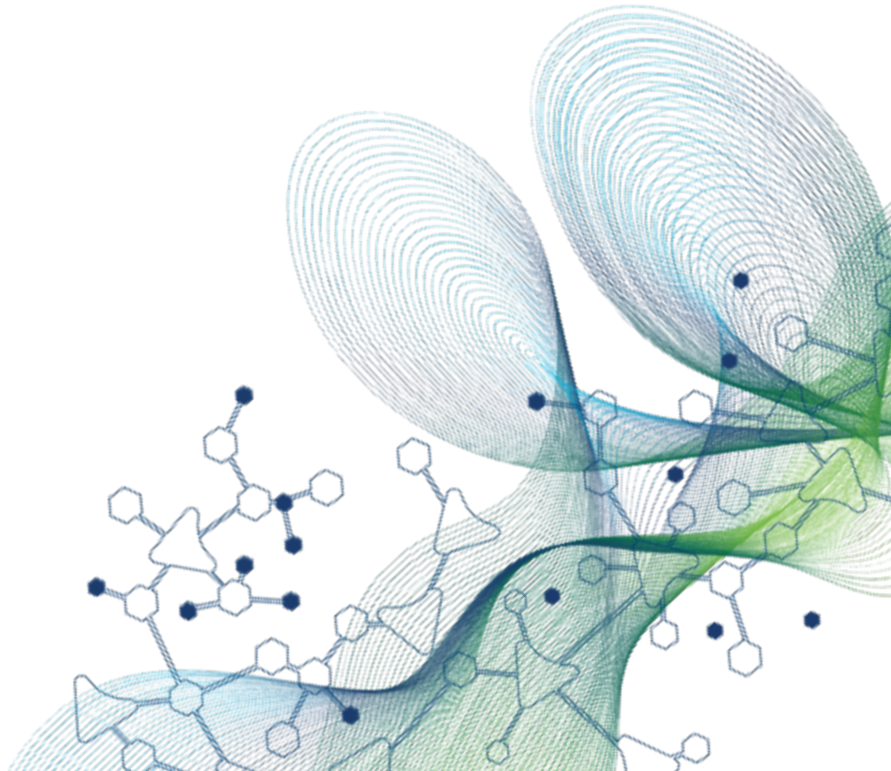

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