

EMISSIONS
REDUCTION
ALBERTA



2020-2023 Business Plan

PREFACE:

ADAPTING TO CHALLENGING TIMES

Amid ERA's 2020/2023 business planning process, the COVID-19 pandemic and drastic decline of oil prices has quickly changed, at least for now, how the world does business. Amongst unstable financial markets and economies globally Alberta is being called upon to take action to slow the spread of COVID-19 and support economic recovery efforts.

The Emissions Reduction Alberta (ERA) team, like many others, has gone virtual to provide uninterrupted service and deliver our mandate to accelerate late stage technology development to grow the economy and reduce greenhouse gas emissions.

While a focus on health is paramount, we must also keep an eye on the need to maintain a resilient innovation community as we navigate this economic turbulence. There is an urgent need to respond to these near-term threats while also identifying opportunities and solutions for longer term economic recovery, investment attraction, and growth. The work laid out in this Business Plan is critically important—perhaps now more than ever.

ERA is finding innovative ways to provide support to our industries, protect jobs and help Alberta emerge from this critical period stronger and more resilient than ever.

We are assessing our current funding and business model to identify creative solutions to support our portfolio of companies as we ride out the economic and COVID-19 disruptions and prepare to get Alberta back to work. We are engaging with our funding partners across the innovation system to ensure any action is aligned and complementary.

Although face-to-face meetings and stakeholder events have been largely cancelled or postponed, ERA is finding new ways to deliver important programming and continuing to inspire collaboration and innovation in this province.

For ERA, it is imperative to continue executing a Business Plan that will help keep Alberta's economy strong. During this time of unprecedented uncertainty, we will continue to identify and accelerate the innovation and investment required to realize Alberta's greatest possibilities.

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Message from the Chair

Jurisdictions around the world are seeking sustainable solutions to the challenges of rising energy and food demand. Concerns about the impact of climate change are increasing, as are expectations regarding the pace of transition to a low carbon economy and the creation of new economic opportunities. Importantly, many global investors are placing sustainability at the forefront of portfolio development and risk management, and enhancing their focus on sustainability-related performance and disclosure. In short, there is increasing global commitment to sustainability, particularly as it relates to climate change. In this context, the challenges and opportunities for Alberta include:

- ▶ Significantly reducing greenhouse gas (GHG) emissions from our current economy, particularly in the oil and gas sector, to remain competitive in both domestic and global markets
- ▶ Developing, implementing and exporting the clean technologies that advance the energy system transformation the world needs
- ▶ Diversifying and expanding our economy in areas where Alberta has inherent expertise and competitive advantage (e.g., agriculture and forestry)
- ▶ Demonstrating leadership in the sustainable transmission and use of energy.

These solutions will reduce GHG emissions, lower costs, create jobs, diversify our economy, and enable our province to remain globally competitive.

Private and public sector investment in technology and innovation is a key enabler in achieving these outcomes and ensuring that Alberta is a global leader – successfully competing in areas of current economic advantage and building on this foundation to create opportunities for the future.

ERA is uniquely positioned to contribute to Alberta's transformation. We have a strong track record of investing the revenue from the price on carbon paid by large final emitters in technology solutions that provide demonstrable environmental and economic benefits. And our efficient cost structure and governance model enable flexibility and adaptability.

Each year, we review our priorities and investment portfolio to ensure our organization remains proactive in the context of the evolving external environment and responsive to the needs and expectations of our key partners and stakeholders. This Business Plan outlines our strategic priorities, our areas of focus for investment, and the actions we will take to deliver on our mandate. The Plan also provides for the collaboration, networking, communications and engagement activities necessary to get technology to market. In addition, it identifies opportunities for future investment while recognizing the Government of Alberta's current fiscal challenges.

This Business Plan delivers substantive outcomes related to GHG emissions reductions, and economic growth and diversification. It is responsive to the increasing focus on sustainability and the rapidly changing external context in which ERA is positioned, and it outlines opportunities to accelerate investment in technology and innovation should there be scope for scale-up of our investment over this period.

Sincerely,

Dave Collyer

Chair, Emissions Reduction Alberta



Message from the CEO

For over 10 years, ERA has been a key partner in helping Alberta achieve its environmental, innovation, and economic goals. Since we were established in 2009, we have committed \$607 million toward 183 projects worth \$4.1 billion that are helping to shape a province with a competitive and diverse economy, a healthier environment, stronger and more resilient communities, and a robust innovation ecosystem.

ERA's portfolio focuses on four strategic investment areas spanning cleaner oil and gas, low emitting electricity, food, fibre and bioindustries as well as low carbon industrial processes and products. The projects we invest in are converting carbon into innovative products that can lead to emissions reductions worldwide. They include innovation aimed at carbon sequestration, leveraging existing oil and gas drilling expertise and technology to support new geothermal energy solutions, as well as projects focused on recovering heat from industrial processes to generate electricity. ERA's investments are delivering real results.

Each year, we have engaged our key stakeholders to gain valuable input on how our funds can achieve the greatest impact. This feedback has led to more refined funding challenges with clearer guidelines, Call for Proposal timelines that work better for innovators, and guidance to our team of experts that helps them identify the most promising projects, with the highest potential for commercial deployment.

Recently, the Government of Alberta announced the winding down of Energy Efficiency Alberta (EEA). ERA is working with the Province and EEA on a plan that would see our organization assume responsibility for new program outcomes targeting industrial and commercial entities. Since 2009, reducing costs and carbon across industry sectors has been core to ERA's mandate. We have a proven business model that offers the organizational efficiencies and effective results the Government of Alberta is seeking.

During the days and months ahead, we will continue to work with stakeholders to identify areas where ERA can provide help that will mitigate the impacts of COVID-19, low oil prices and support the long-term recovery of Alberta's economy.

No single entity can solve the challenges the world is grappling with. At ERA, we know it will take a systems approach to re-build the economy. Our Plan provides the flexibility and innovative approach needed to accelerate technologies that reduce emissions, make carbon management an inherent component of Alberta's economy, and create the right conditions for continued investment in Alberta during this time of unprecedented economic uncertainty.

In 2019, we published the third edition of our Technology Roadmap (TRM) to provide greater context on the climate change challenge. The TRM identifies ERA's investment principles, as well as our portfolio approach to investment opportunities that deliver the results in both the short term and longer term.

Alberta needs a credible and compelling story to clearly demonstrate we are a key part of Canada's and the world's low carbon transformation.

I am pleased to present to you a business plan that will deliver the actions to help tell that story.

Sincerely,

Steve MacDonald
CEO, Emissions Reduction Alberta

1.0 EXECUTIVE SUMMARY

The world is seeking solutions that can address the climate change challenge and support continued economic growth. Many businesses, industries, and governments across the globe are making bold GHG emissions reduction commitments and are pursuing the pathways and actions to get there. At ERA¹, we know that technology innovation is critical to creating jobs, attracting investment, and building a diversified, lower carbon economy that also meets our environmental objectives.

Implemented on January 1, 2020, the Government of Alberta's new Technology Innovation and Emissions Reduction (TIER) regulation will continue to price carbon for Alberta's largest emitters. ERA remains one of the delivery agents responsible for reinvesting these funds into projects and innovative technologies.

A DECADE OF FUNDING INNOVATION



Since 2009, ERA has been accelerating the development and adoption of innovative clean technology solutions. We have committed \$607 million toward 183 projects. These projects have the potential to reduce emissions by 34.8 million tonnes of CO₂e by 2030. That is the amount of carbon sequestered by over 575 million trees growing for 10 years, or equivalent to taking more than seven million cars off the road for one year.

OUR PORTFOLIO

ERA's portfolio of investments includes projects that align with Alberta's economic and environmental priorities. We regularly review and refine our portfolio to ensure we are being responsive to the needs of the province's industries and innovators. For this business plan, our portfolio will include:

- ▶ Cleaner oil and gas
- ▶ Low emitting electricity system
- ▶ Food, fibre, and bioindustries
- ▶ Low-carbon industrial processes and products.

¹ The CCEMC legal name continues to exist but is not public facing. Emissions Reduction Alberta (ERA) is a legal tradename of Climate Change and Emissions Management (CCEMC) Corporation.

THREE STRATEGIC PRIORITIES

To deliver on our mandate we have established three key strategic priorities:

1. ACCELERATE TECHNOLOGY

Core to our business is investing in the pilot, demonstration, and deployment of technologies that improve Alberta's cost and carbon competitiveness. These investments are guided by our Technology Roadmap—a living document that defines key technology pathways, and the portfolio for ERA's funding. Success will require engaging with stakeholders to better understand investment opportunities, and raising the profile of Calls for Proposals and funding recipients.

2. DRIVE COMMERCIALIZATION

At ERA, we know that funding alone will not result in the economic growth and GHG reductions we envision for Alberta. Today's innovators face significant challenges that hinder technologies from scale-up, commercialization, and marketplace deployment and adoption. Success requires that we convene resources and facilitate strategic partnerships with industry, government, business, academia, and other funders to foster a suite of policy, regulatory, program and business innovation tools that will help address barriers to commercialization.

3. MAXIMIZE IMPACT

ERA is funded by the Government of Alberta. We maximize the value of these funds by communicating successes, and by leveraging our investment through partnerships with the Federal Government and other organizations focused on climate innovation. For every dollar ERA invests, another \$5.90 is also invested by industry, innovators and other project funders. We also maximize our impact by delivering excellence in operations, and through rigorous performance measurement and reporting.

For every dollar ERA invests, another \$5.90 is also invested by industry, innovators and other project funders.

THE PATH FORWARD

In a challenging economic environment, Alberta is facing the pressure of trying to improve business and industry competitiveness, while reducing its GHG emissions. ERA continues to be in a position to advance innovative technology solutions that will help Alberta and its industries lead the transformation to a lower carbon future.

This 2020/2023 Business Plan sets out the actions ERA will take to deliver on our mandate, based on a budget assumption of receiving grants of \$50 million, \$75 million, and \$100 million in each of the next three fiscal years, respectively.

Critical among these actions is the delivery of competitive funding opportunities. Examples of potential focus areas for future Calls for Proposals could include:

- ▶ Emerging technologies for our communities and built infrastructure
- ▶ Advancing the hydrogen economy
- ▶ Innovative solutions to increase electrification
- ▶ Reducing emissions in oil and gas production
- ▶ Hydrocarbon to value added.

Annual Calls for Proposals will be augmented by our Partnership Intake Program—a flexible mechanism for ERA to fund innovative projects that are brought forward by our trusted funding partners in the innovation system.

ERA will continue to convene the resources required to accelerate the adoption of technology solutions. This will include implementation of our Innovator Support Pilot, as well as further growth and leverage of our trusted partner network to support scale-up, adoption, growth, and export of made-in-Alberta solutions.

A SCALABLE BUSINESS PLAN

This Business Plan—and the activities ERA has committed to undertake—are scalable. The funding amount ERA receives is only a small fraction of funds that industries require to scale, implement and commercialize their technologies. ERA calls have typically been oversubscribed, signaling the need from industry for additional funding support. With additional resources invested in innovation, greater economic and environmental outcomes for Alberta will be possible. ERA's efficient and responsive business model allows us to scale up (or down) operations in response to changes in the total funding available for investment.

2.0 ABOUT OUR ORGANIZATION

We are Emissions Reduction Alberta

Emissions Reduction Alberta (ERA) was created in 2009 to help deliver on the province's environmental and economic goals. ERA takes action on climate change and supports economic growth by investing in the pilot, demonstration and deployment of clean technology solutions that reduce GHGs, lower costs, attract investment, and create jobs in Alberta. Investment in these technologies will:

- ▶ Improve the competitiveness of our existing industry by lowering costs and improving environmental performance
- ▶ Create opportunities for new businesses and continued economic growth.

On January 1, 2020 the Government of Alberta implemented its new Technology Innovation and Emissions Reduction (TIER) regulation. Under this carbon pricing mechanism, large emitters in Alberta will continue to meet GHG emissions performance benchmarks. Regulated facilities can comply with these benchmarks by making on-site emission reductions, using emissions performance credits or offsets, or by paying into the TIER compliance fund at \$30/tonne of CO₂e. ERA remains one of the delivery agents responsible for reinvesting these funds into innovative technologies.

MANDATE

Reduce GHG emissions and grow Alberta's economy by accelerating the development and adoption of innovative technology solutions.

VISION

Alberta has a competitive economy that delivers sustainable environmental outcomes, attracts investment, and is leading the transformation to a low carbon future.

ERA'S VALUE PROPOSITION

Our investments help innovators develop and demonstrate GHG-reducing technologies. These technologies will lower costs, improve competitiveness and accelerate Alberta's transformation to a low carbon economy.

Core Values



INNOVATION



COLLABORATION

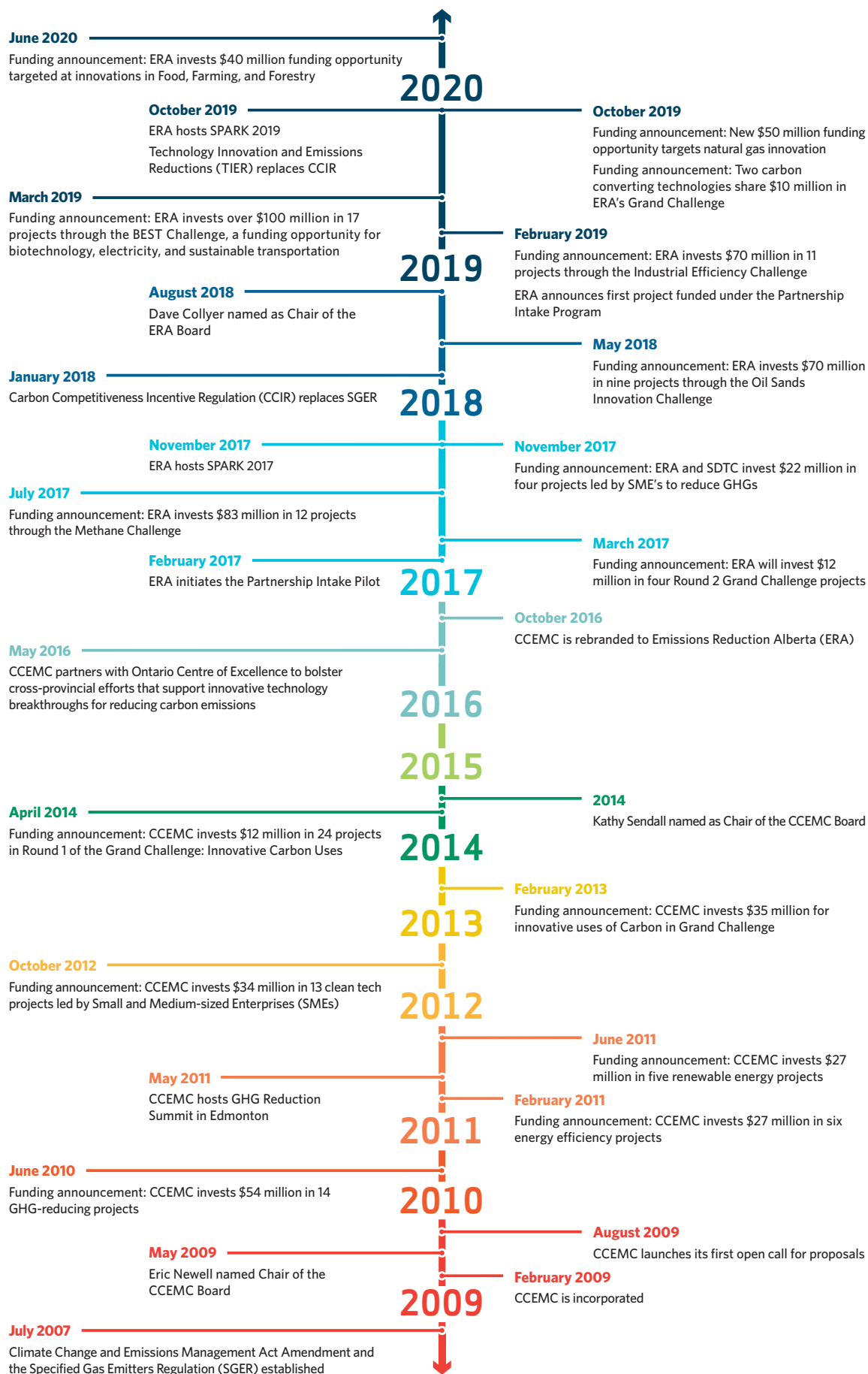


TRANSPARENCY



INTEGRITY

ERA was created in 2009 as the Climate Change Emissions Management (CCEMC) Corporation. It was established to invest the revenue generated from the price on carbon paid by large emitters into innovative, GHG-reducing technologies.



ERA's unique business model

While many jurisdictions have a mechanism to invest in clean technology, the ERA model is unique:

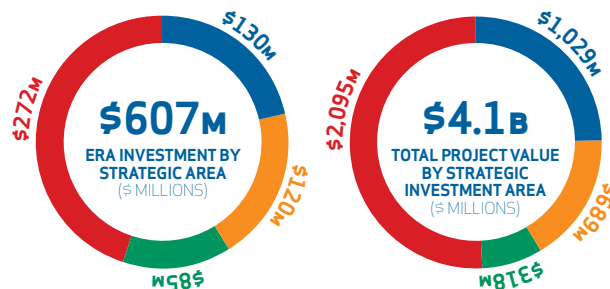
- ▶ Our funding is sourced from Alberta's large emitters who are required to reduce their GHG emissions to meet regulated targets under Alberta's TIER regulation.
- ▶ We offer a clear line of sight from the carbon price paid by industry to investment in the solutions needed to help achieve emissions reductions.
- ▶ We fund later-stage technology, which means we accelerate projects toward broader industry deployment and adoption by helping to de-risk projects in the crucial pilot, demonstration, and scale-up stages of development.
- ▶ Our non-dilutive² grant funding helps accelerate clean technologies through development stages where private industry and financial institutions are often unwilling to invest due to technology risk.
- ▶ Our Delegated Administrative Organization (DAO) structure means we have no annual investment caps, we can fund multi-year projects, we can carry funding over from year to year, and we can take back and reinvest funds when projects do not progress.
- ▶ Our operating model is extremely efficient; in 2019, our operating costs represented just two per cent of the total funds we invest.
- ▶ We require that every dollar invested by ERA is matched 1:1 by private investment, ensuring there is a market demand for the technology. Historically, we have significantly exceeded this requirement. For every dollar invested by ERA, another \$5.90 is invested by industry, innovators and other project funders.
- ▶ We take action on climate change and support economic growth and diversification by accelerating projects that reduce GHGs, attract investment, and create jobs in Alberta.

²Non-dilutive funding is defined as funding that does not require you to give up ownership or equity of your company or product.

Investing in a Diverse Portfolio

183 Projects Total

- ▶ **Cleaner Oil & Gas**
(68 Projects)
- ▶ **Low Emitting Electricity Supply & Demand** (24 Projects)
- ▶ **Food, Fibre, & Bioindustries**
(47 Projects)
- ▶ **Low Carbon Industrial Processes & Products**
(44 Projects)



Cumulative Project Emission Reductions*

7.5 Mt CO₂e Total by 2020



34.8 Mt CO₂e Total by 2030



ERA estimates our current investment portfolio will result in emissions reductions of an average of 3.2 million tonnes per year over the next decade. This is equivalent to the amount of carbon sequestered by almost 683 million trees growing for 10 years, or equivalent to taking almost nine million cars off the road.

*We have estimated emission reductions for all projects with approved funding commitments and executed funding agreements and assumed the projects will continue successfully and as planned. Should circumstances change for these projects, emission reduction estimates may change materially.

Creating Jobs and Diversifying the Economy

Since 2009, ERA has committed \$607 million in funding to 183 projects. ERA funding is leveraged, and for every dollar we invest, another \$5.90 is also invested by industry, innovators and other project funders.

ALBERTA

PERSON-YEAR* JOBS IN ALBERTA BY 2024

20,900

GDP IMPACT TO ALBERTA BY 2024

\$3 BILLION

CANADA

PERSON-YEAR* JOBS IN CANADA BY 2024

30,000

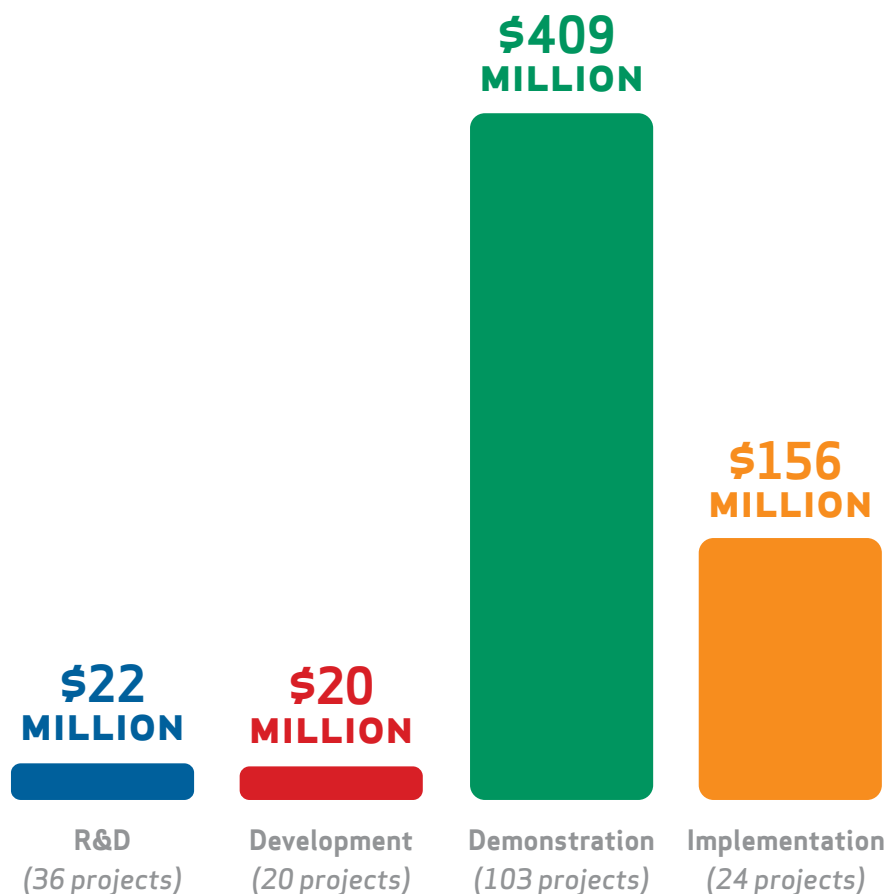
GDP IMPACT TO CANADA BY 2024

\$4 BILLION

*A person-year is equal to one-year of employment for one individual.
Please note: economic impact is reported on a calendar year basis, not fiscal year.

Investment by Innovation Stage

ERA's funded projects largely focus on later stages of technology development, including field pilot, demonstration, and first-of-kind deployment projects. We work with other organizations in Alberta and Canada who are working to advance GHG-reducing solutions to create a continuum of support that spans the innovation development spectrum.



ERA is well placed to deal with the risks of innovation. Our funding is non-dilutive, meaning proponents do not have to give up ownership, project equity or intellectual property. Our independent, transparent, and rigorous due diligence and selection process is designed to minimize this risk. Once projects are selected, ERA continues to provide ongoing support to proponents, convening resources, expertise, and partnerships that help improve the opportunity for success. When projects do not progress as expected, we focus on the lessons learned, sharing the knowledge we gain with others who may innovate more quickly as a result of those experiences.

3.0 DELIVERING ON OUR STRATEGIC PRIORITIES

The Government of Alberta provides ERA with an annual grant to deliver on our Business Plan. The actions laid out in this 2020/2023 Plan are based on ERA receiving grants of \$50 million, \$75 million, and \$100 million in each of the next three fiscal years, respectively.

This 2020/2023 Business Plan, and the activities ERA has committed to undertake, are scalable.

The international community is rallying around the Paris Agreement and its new long-term strategy to attain net-zero by 2050. Countries are under increased pressure to demonstrate their commitment to this goal with many jurisdictions pledging action. Canada has committed to a net-zero goal by 2050 and collectively, the provinces are also working towards this.

ERA's efficient business model and sound processes allow us to be nimble and responsive to the current funding environment and market needs. However, the funding amount ERA receives is only a small fraction of funds that industries require to scale, implement and commercialize their technologies. ERA's competitive Calls for Proposals have been oversubscribed, signaling the need from industry for additional funding support. Therefore, when additional funds are available, ERA could increase the funding made available per competitive call, supporting more projects for each round, or increasing the amount awarded to individual projects. Additional resources invested toward innovative, GHG-reducing technologies could result in greater GHG and economic impacts for Alberta.

In June, the Government of Alberta announced the winding down of Energy Efficiency Alberta (EEA). ERA is working with the Province and EEA on a plan that would see ERA assume responsibility for new program outcomes targeting industrial and commercial entities.

This transition represents an opportunity to leverage ERA's experience and "complete solutions" approach to enable further cost and carbon reductions across sectors of Alberta's economy.

Our goal now is to identify the best way to leverage the capacity of EEA, and develop and implement programs that will deliver improved environmental and economic outcomes for Alberta.

The Partnership Intake Program is now fully operational, and this pipeline of potential projects is growing. Additional funds could be allocated toward this important mechanism for accelerating technology.

STRATEGIC PRIORITY 1:

Accelerate Technology

Invest in GHG-reducing technologies that help Alberta grow existing industries and create new ones.

ACTIONS

1. Invest in the pilot, demonstration, and deployment of projects that align with ERA's Technology Roadmap and market needs, and support Alberta's economic and environmental priorities.
2. Fund later stage, innovative technology solutions through competitive funding calls and the Partnership Intake Program.
3. Employ a rigorous process to select innovative projects that facilitate GHG emission reductions and have the strongest potential for uptake by the market.
4. Host stakeholder workshops, leverage our trusted partner network, and undertake technology scouting to identify solutions that build on Alberta's strengths and help create new business opportunities.

OBJECTIVES

- ▶ Attract the best quality project applications for ERA's competitive Calls for Proposals and Partnership Intake Program
- ▶ Accelerate Alberta-based clean technology projects toward commercialization and deployment in the marketplace
- ▶ Decrease GHG emissions in Alberta from projects funded by ERA.

STRATEGIC PRIORITY 1: ACCELERATE TECHNOLOGY

IMPACTS

- ▶ Accelerate widespread adoption of bold clean technology solutions that reduce GHG emissions in Alberta, Canada, and internationally
- ▶ Increase economic competitiveness, growth and diversification through existing and new industries
- ▶ Enhance Alberta's global reputation as a progressive steward of the environment
- ▶ Increase skills, employment, and investment attraction in Alberta's clean technology sectors.

KEY MEASURES



PROJECT AND MARKET
GHG REDUCTIONS



TOTAL PROJECT INVESTMENT



TECHNOLOGY READINESS LEVEL
(TRL) PROGRESSION

STRATEGIC PRIORITY 1: ACCELERATE TECHNOLOGY

Action 1: Invest in the pilot, demonstration, and deployment of projects that align with ERA's Technology Roadmap and support Alberta's economic and environmental priorities.

Delivering on the world's bold ambitions to meet growing energy demand, significantly reduce GHG emissions, grow economies, and improve quality of life requires investment to accelerate innovation and transformative technologies.

ERA's investments are guided by our Technology Roadmap—a living document that we regularly refresh to ensure our organization remains responsive to the evolving needs of Alberta's industries and innovators.

The Technology Roadmap:

- ▶ Identifies key guideposts and indicators for what a low-carbon future might look like for Alberta
- ▶ Defines potential innovation and technology pathways for achieving Alberta's desired environmental and economic outcomes
- ▶ Maps the tactical options and initiatives to deliver needed solutions for each pathway
- ▶ Identifies potential high impact technology investments that can help reduce GHGs and grow Alberta's economy.

ERA'S TECHNOLOGY ROADMAP IDENTIFIES FOUR AREAS OF FOCUS FOR OUR INVESTMENTS:

CLEANER OIL AND GAS

Transformative technologies and innovation to reduce the GHG footprint of Alberta's fossil fuel supply chain and explore alternative fuel and value-add opportunities that can help sustainably grow and diversify the province's energy economy.

LOW EMITTING ELECTRICITY SYSTEM

Technology and innovation to support a reliable, lower carbon electricity system, including reducing the GHG footprint of Alberta's electricity supply mix, increasing the deployment of renewable energy, and enabling a smarter electricity grid that can power Alberta's homes and businesses.

FOOD, FIBRE, AND BIOINDUSTRIES

Innovative processes and technologies to advance Alberta's bioeconomy and reduce GHG's, including novel agricultural and forestry practices; bioenergy and biomaterials; waste management and waste to energy; and enhanced carbon retention.

LOW-CARBON INDUSTRIAL PROCESSES AND PRODUCTS

Technologies to deliver GHG reductions through energy efficiency, industrial process innovation, and low-GHG materials and chemicals.

STRATEGIC PRIORITY 1: ACCELERATE TECHNOLOGY

Action 2: Fund later stage, innovative technology solutions through competitive funding calls and our Partnership Intake Program.

ERA's funding will be made available primarily through the delivery of targeted, competitive funding opportunities. Accelerating and de-risking later-stage, GHG-reducing technologies requires significant capital investment. Historically, a single ERA call for proposals funds between \$30 million and \$100 million worth of projects. The amount of capital required to accelerate technologies in any given call for proposals depends on the capital intensity of the industries or sectors of focus. For example, innovative projects in Alberta's oil sands are typically more capital intensive than solutions in agriculture.

With ERA's Natural Gas Challenge projects recently approved and the launch of the Innovation in Food, Farming, and Forestry Call for Proposals, we are looking ahead to further addressing industry innovation needs in Alberta. The following section identifies five specific areas of interest that represent potential funding opportunities. These areas have been informed by the priorities and guideposts laid out in the Technology Roadmap and stakeholder engagement activities held in 2019 and early 2020.

Examples of potential focus areas for future competitive calls for proposals could include:

Emerging Technologies for Alberta's Communities and Built Infrastructure

Alberta is home to 17 cities, 108 towns, 93 villages, 64 municipal districts, eight Métis settlements, and 140 First Nations reserves. These communities represent important economic, social, and cultural hubs, yet these concentrations of people, buildings, businesses, industries, and vehicles also represent a significant and growing source of GHG emissions. In 2015, the combined emissions from buildings, transportation, electricity generation, and waste sectors amounted to 100 Mt CO₂e in Alberta.

These cities and communities also represent hubs for entrepreneurialism and innovation. Across the province and the country, populations are rising to the challenge of responsibly growing their communities, and the neighbourhoods, businesses, and industries they encompass, while reducing GHG emissions. ERA funding could play a role in accelerating opportunities, including:

- ▶ Innovative building construction using green materials and inputs
- ▶ Sustainable urban planning
- ▶ Digitization (e.g., smart meters, sensors, etc.)
- ▶ Improved waste management
- ▶ Electrification
- ▶ Repurposing current infrastructure.

STRATEGIC PRIORITY 1: ACCELERATE TECHNOLOGY

In Alberta, bridging the gap between rural and urban centres presents challenges but also represents an opportunity. Rural communities generally have fewer resources to devote to innovative technology development and are more focused on delivery of core essential services. However, improvements to delivery of essential services such as waste management, heating capacity in older buildings, and public transportation also represent prime areas for innovative, GHG-reducing technologies. Furthermore, smaller, less dense rural communities could be pioneers for new technologies (e.g., electrification of transportation or building heating), which can then be scaled for integration into more dense and complex urban environments.

Advancing the Hydrogen Economy

Alberta can lead the shift to a lower carbon future by capitalizing on its current industry and resource base. The use of hydrogen is becoming increasingly important as more countries turn to fuel cells to heat and power anything from vehicles to buildings to industrial operations. Alberta's vast hydrocarbon reserves and renewable resources position Alberta amongst the lowest cost producers of hydrogen in the world. There is an opportunity to both lower the cost and increase the viability of technologies including:

- ▶ Blue hydrogen (produced from natural gas or other fossil fuels by steam-methane reforming coupled with carbon capture and storage)
- ▶ Green hydrogen (produced from water electrolysis using renewable energy)
- ▶ Infrastructure for hydrogen storage and distribution
- ▶ Fuel cell integration
- ▶ Alternative uses for hydrogen as an energy or non-energy source to create other value-add products.

ERA is currently funding the Alberta Zero Emission Truck Electrification Collaboration³, a project which is set to demonstrate the viability of a long-range fuel cell electric truck. Projects like this could spur further investment into the development of new technologies in applied transportation. Hydrogen-related technologies can play a critical role in decarbonizing the economy while also increasing jobs and investment in the province by leveraging national and international market opportunities as the global demand for hydrogen grows.

Innovative Solutions to Increase Electrification

In 2017, [Statistics Canada](#) noted Alberta's electricity sector emitted over 44 Mt CO₂e, over half of Canada's total emissions from the electricity sector (74 Mt CO₂e). According to the Alberta Electric System Operator, as of March 2019, the majority of Alberta's power generation comes from coal-fired power plants (35 per cent), cogeneration (30 per cent), and combined-cycle natural gas (10 per cent). Ensuring Alberta can reduce GHG emissions while maintaining its high standard of living and growing its economy

³ Retrieved from <https://eralberta.ca/projects/details/alberta-zero-emissions-truck-electrification-collaboration-azetec/>

STRATEGIC PRIORITY 1: ACCELERATE TECHNOLOGY

will require development and deployment of innovative solutions to decarbonize its electricity system, including:

- ▶ Increased electrification
- ▶ Demand-side management
- ▶ Decarbonized electricity generation
- ▶ Grid optimization (microgrids and smart grids)
- ▶ Advanced battery and other energy storage
- ▶ Solar roads (e.g., solar panels embedded in roads and sidewalks)
- ▶ Autonomous vehicles and improved vehicle fleet management.

While Alberta works to ensure its policies and regulations continue to enable sustainable grid modernization, various technology opportunities present themselves. Alberta is in a position to lead in the extraction and processing of rare earth and other metals needed to manufacture items such as advanced battery technology, solar panels, and fuel cells. Leveraging our current oil and gas infrastructure and expertise, Alberta can make advancements in the deployment of geothermal energy and lower its baseload emissions generation.

Reducing Emissions in Oil and Gas Production

As noted above, Alberta is a resource-rich province and continues to supply national and international markets with oil and gas. There remains great potential to develop more efficient extraction methods. For example, upstream oil and gas emissions in Alberta were reported at over 130 Mt CO₂e. Industry stakeholders are aware of growing national and international interest in driving toward net-zero emissions by 2050 and are committed to improving performance and demonstrating action to their investors. Lowering emissions and costs in upstream oil and gas operations will continue to demonstrate Alberta's ability to produce clean hydrocarbons while remaining in-demand and competitive. Innovative solutions in the following areas will advance these objectives:

- ▶ Integration of solvents for advanced recovery
- ▶ Monitoring and detection of fugitive emissions
- ▶ Carbon capture, utilization and storage
- ▶ Coupling energy generated from renewables with resource extraction
- ▶ Extracting and using rare earth elements for production of products such as catalysts, glass, and other compounds.

ERA heard from stakeholder groups that working toward a net-zero future does not mean leaving our resources behind; rather we are in a position with an abundance of potential. We leverage the experience and knowledge in Alberta to sustainably develop resources and create new business opportunities.

STRATEGIC PRIORITY 1: ACCELERATE TECHNOLOGY

Hydrocarbon to Value Added

In tandem with developing Alberta's natural resources for a more integrated economy, there are opportunities to look beyond traditional markets. Two current examples of ERA's activities in this area include the \$35 million global Grand Challenge and our partnership with the XPRIZE Foundation to accelerate carbon utilization technologies using the Alberta Carbon Conversion Technology Centre (ACCTC). Alberta can build on these initiatives and offer a wide range of products derived from hydrocarbons such as:

- ▶ Hydrogen
- ▶ Renewable fuel
- ▶ Pre- and post-combustion capture and storage/use technologies
- ▶ Carbon fibre
- ▶ Polymer-based products.

Offering these products will create local and global economic opportunity and demonstrate Alberta's ability to develop its natural resources to their full potential. Energy and non-energy products will create value from both carbon and hydrogen. These opportunities leverage Alberta's existing expertise and previous investments in carbon capture, utilization and storage (CCUS) infrastructure such as the Alberta Carbon Trunk Line, Shell Quest, and the ACCTC.

INNOVATION IN AGRICULTURE, AGRI-FOOD AND FORESTRY

The agricultural and forestry sectors are an important part of Alberta's economy, and are ripe with opportunities for growth, diversification, and GHG reductions. To date, ERA has funded over \$120 million worth of projects in the food, fibre and bioindustries. These projects are estimated to reduce emissions by 6.3 Mt CO₂e by 2030. With several of Alberta's large industrial emitters found in this sector, opportunities exist to not only reduce emissions from production and processing of food and fibre, but also to leverage nature-based solutions and other activities that sequester carbon from the atmosphere. On June 1, 2020, ERA launched its \$40 million Food, Farming, and Forestry Challenge. We see this funding challenge as an important way to stimulate Alberta's agri-food, agri-tech and related industries. However, we are aware recent circumstances related to COVID-19 and the global crisis could impact some applicants and their ability to apply. To achieve the outcomes of ERA's Food, Farming and Forestry Challenge and provide flexibility for applicants affected by the current economic realities, ERA will continue to monitor and adapt the process, if needed, to meet the needs of industry and the province. This funding opportunity targets innovative GHG-reducing solutions such as creating value from agricultural and forest waste, nutrient management, automation and digitization of operations, genomics, applications of alternative energy, zero-carbon seeding, monitoring and detection technologies, and nature based-solutions.

STRATEGIC PRIORITY 1: ACCELERATE TECHNOLOGY

Partnership Intake Program

In addition to our competitive Call for Proposals process, projects can also be brought forward for consideration by trusted funding partners through the Partnership Intake Program. Trusted partners are funding organizations with rigorous, fair, and transparent due diligence processes comparable in principle to ERA's, including elements such as peer review and technical expertise.

In September 2018, ERA approved the first set of projects under the Partnership Intake Program. The process has been highly effective for accelerating innovation, maximizing impact through leverage of partner funds, and reducing the administrative burden for project proponents.

Going forward, ERA will seek to further leverage these existing partnerships and seek out new, value-add partners that can help advance technologies. ERA has established trusted partnerships with:

- ▶ Alberta Innovates
- ▶ Natural Resources Canada (NRCan)
- ▶ Northern Alberta Institute for Technology (NAIT)
- ▶ University of Calgary
- ▶ University of Alberta
- ▶ Sustainable Development Technology Canada (SDTC)
- ▶ Business Development Bank of Canada (BDC)
- ▶ Ontario Centres of Excellence
- ▶ Natural Gas Innovation Fund (NGIF)
- ▶ Evok Innovations
- ▶ XPRIZE Foundation.

ANNOUNCING FUNDING CALLS AND RECIPIENTS

ERA has a robust communication plan to raise the profile of each new funding recipient. This typically includes a media announcement involving a Government of Alberta Minister, validators from industry, recipients, potential technology adopters, and influencers. These announcements are leveraged through all ERA communication platforms with stories shared on social media, website, featured in the Stewardship Report, and through podcasts.

STRATEGIC PRIORITY 1: ACCELERATE TECHNOLOGY

Action 3: Select innovative technologies through a rigorous process and transparent criteria that facilitate GHG emission reductions and have the strongest potential for uptake by the market.

All of ERA's potential investments are assessed against a set of transparent criteria and undergo a rigorous due diligence review to select projects that can best deliver on our mandate and Technology Roadmap. ERA relies upon a three-stage process to ensure that our funds are invested prudently.



The entire ERA evaluation process involves oversight by an independent Fairness Monitor who ensures all applicants are treated in a fair and impartial manner. The Monitor reports directly to our Board of Directors and shares findings before any funding decisions are made.

STRATEGIC PRIORITY 1: ACCELERATE TECHNOLOGY

Action 4: Host stakeholder workshops, leverage our trusted partner network, and undertake technology scouting to identify solutions that build on Alberta's strengths and help create new business opportunities.

Face-to-face communication plays a prominent role in ERA's communication strategy. Bringing people together to have real conversations builds clarity and can accelerate action. Although ERA regularly hosts meetings with stakeholders to better understand opportunities, our conference and workshop plan involves a series of targeted engagement events to inform our Business Plan and upcoming funding calls. During the COVID-19 pandemic, ERA will transition conferences and workshops to virtual platforms and continue to meet with stakeholders online.

In 2020/2023, ERA plans to further develop its trusted partner network and technology scouting capacity. For example, ERA's broad network of partners provides the opportunity to identify shared challenges, become aware of opportunities, and engage with innovators. In addition, ERA has purposefully engaged in targeted outreach and hosted workshops that involve a multitude of critical stakeholders who provide intelligence that helps shape Calls for Proposals.

By actively seeking out innovative solutions under development, ERA will ensure that the best technologies are accelerated to meet the evolving needs of the province.



Mark Summers and Elizabeth Shirt speaking at SPARK Carbon+ in 2019.

STRATEGIC PRIORITY 2:

Drive Commercialization

Convene the resources required to accelerate the commercialization and wide spread adoption of technology solutions that lead to economic growth and GHG reductions in Alberta.

ACTIONS

1. Manage a portfolio that reflects both “policy push” from government and “market pull” from industry.
2. Build upon ERA’s credibility as a convener of resources and facilitate strategic partnerships that help address barriers to commercialization through initiatives like our Innovator Support Pilot.
3. Help identify opportunities for policies and regulatory changes that enable more rapid adoption of clean technology solutions.

OBJECTIVES

- ▶ Increase commercialization and market adoption of ERA-funded technologies
- ▶ Technological learnings and knowledge-sharing to help accelerate commercial deployment of GHG-reducing technologies
- ▶ Measurable jobs (temporary and permanent), GDP creation in new and existing sectors, and economic benefits (direct and indirect) created in Alberta from projects funded by ERA
- ▶ Increase recognition of Alberta as an innovation and clean technology leader and strong environmental steward.

STRATEGIC PRIORITY 2: DRIVE COMMERCIALIZATION

IMPACTS

- ▶ Accelerate commercialization and adoption of Alberta-based clean technologies across Canada and around the world
- ▶ Successful and profitable Alberta companies commercialize solutions that the market needs
- ▶ ERA supports Alberta's transformation to a low-carbon economy.

KEY MEASURES



COLLABORATIVE PARTNERSHIPS

TECHNOLOGY INVESTMENT
TRL PROGRESSIONINVESTMENTS
GDP IMPACT

JOB CREATION

PERCENTAGE OF COMPLETED
PROJECTS CONTINUING TOWARD
COMMERCIALIZATIONPERCENTAGE OF PROJECTS SUPPORTING
SMALL AND MEDIUM-SIZED ENTERPRISES

STRATEGIC PRIORITY 2: DRIVE COMMERCIALIZATION

Action 1: Manage a portfolio that reflects both “policy push” from government and “market pull” from industry.

For new technology to become commercialized, it must provide a solution that aligns with a market opportunity. To ensure we are funding technologies that will be taken up by the market, ERA invests in solutions that tackle the problems Alberta must solve today, while also seeking out transformative technologies to grow and diversify the economy and address Alberta's largest GHG sources over the longer-term.

ERA's funding opportunities are always informed by multi-stakeholder workshops and engagements that bring together government, industry, technology developers, academia, and others to discuss Alberta's opportunities and challenges. Bringing together the best and brightest to understand the needs of industry and formulate funding opportunities that address both government and market needs is an effective model that ERA will continue to employ.

Action 2: Build upon ERA's credibility as a convener of resources and facilitate strategic partnerships that help address barriers to commercialization through initiatives like our Innovator Support Pilot.

Beyond funding, innovators face additional challenges that hinder technology advancement and adoption by industry. Public funding is often not enough to accelerate these new technologies through to commercialization. Addressing these gaps requires an all-hands-on-deck approach, with government and industry sitting at the same table. ERA works with government and industry to help address these gaps and works to strengthen companies and their efforts to bring new technologies and solutions to market.

NEW INTERNATIONAL PARTNERSHIPS

In 2020, ERA will enter into its formal, structured international partnership with ACT, which stands for Accelerating CCS Technologies. This is a multinational funding consortium that aims to accelerate carbon capture and utilization (CCU) and CCUS technology development as a tool to stem global warming. This is the technology area that stands to benefit most from international collaboration and ACT has already completed two funding calls. The ACT program was initiated in Europe and involves many countries, including France, Germany, Greece, The Netherlands, Romania, the U.K., the U.S., Turkey, Spain and Switzerland. Iceland, Denmark, Sweden, Norway and Finland are involved through Nordic Energy Research. ERA will contribute \$5 million toward the third ACT funding call. ERA funding will only be directed toward Alberta-based projects. In 2020/2023 ERA plans to seek out additional international partnerships as well as opportunities to publish articles about ERA projects in scientific journals with global reach.

STRATEGIC PRIORITY 2: DRIVE COMMERCIALIZATION

To support economic diversification, job creation, education, training, and climate change action, ERA will work to align with the evolving Alberta innovation system. In addition to funding, we will do our part to convene the resources required for success, including informing the suite of policy, regulatory, program, and business innovation tools required to address system gaps and deploy new technologies. By helping to put these conditions for success in place, we will make it clear to investors and inventors and all the players in between, that Alberta is a place where businesses can advance and commercialize their technologies and solutions.

Building Collaborative Partnerships

Partnerships are central to our success and are critical to delivering on our commitment to drive commercialization, helping us to convene the right resources, and bridge the gaps on technological, business development, financial resources, and capacity challenges. Partnerships enable us to:

- ▶ Align around outcomes, challenges and directed innovation opportunities, so we can limit duplication in the innovation system
- ▶ Develop funding calls that will provide the greatest benefits and leverage for our province's funds
- ▶ Share risk
- ▶ Accelerate technology development
- ▶ Leverage the relationships we have with industry, community businesses, and governments to build stronger connections with technology and service providers.

We have learned a great deal through collaboration, and partnerships will continue to play an important role as we fulfill our mandate. In 2020/2023, we will seek to strengthen existing partnerships with funding organizations like SDTC, and research and technology development organizations such as Canada's Oil Sands Innovation Alliance (COSIA) and Clean Resource Innovation Network (CRIN). As well, we will look to develop new collaborative relationships with academic and research institutions, accelerators and incubators such as Creative Destruction Labs (CDL) and Foresight, and organizations such as Alberta Treasury Branch (ATB) and Export Development Canada, who are exploring opportunities in clean technology investment and green financing.

Supporting Innovators on the Path to Commercialization

The innovation system in Canada and Alberta is complex. ERA is well positioned to leverage and convene capacity in the system to foster the commercialization of innovative technologies, over and above the funding and technical expertise we bring to the table.

When projects are selected and contracted for funding, ERA assigns a project advisor to help steward the project in accordance with its funding agreement. Furthermore, ERA has worked with select funded or contracted projects to address business, financial or commercial readiness challenges.

STRATEGIC PRIORITY 2: DRIVE COMMERCIALIZATION

ERA also incorporates commercial potential criteria for each project into funding applications and contribution agreements. To enhance this perspective, ERA works jointly with Platform Calgary and TEC Edmonton who participate in the upfront project review process and jointly support ERA proponents alongside Alberta Innovates.

Based upon the success of these efforts, ERA sees an opportunity to provide additional proponent support for the benefit of unfunded projects or technologies. ERA is piloting a structured process for providing support capacity to assist promising projects and technologies.

Introducing the Innovator Support Pilot

Through our Call for Proposals process, ERA often identifies projects or technologies that show promise but are not ready for funding due to specific challenges.

The Innovator Support Pilot will test a mechanism to support ERA applicants who have promising technologies but need to improve aspects of their business model, team, or financing before they are ready to receive ERA funding.

This pilot will leverage the knowledge of existing entities and experts in the innovation ecosystem, with ERA providing a triage and connecting function. Key desired outcomes include:

- ▶ Creating a system to improve proposals prior to the application for funding
- ▶ Increasing applicant awareness of funding supports in Alberta's innovation ecosystem
- ▶ Fostering new relationships between participants and innovation system supports and experts
- ▶ Where applicable, directing applicants to ERA or other trusted partners for new or existing funding opportunities.

ERA has brought together a team of business development and commercialization experts who will work with a small cohort of pilot participants. The expert team will support ERA in identifying critical challenges to the development and commercialization of promising technologies, in convening the right resources to address these challenges, and ultimately aims to help prepare a project that can qualify for ERA funding. This pilot will test a mechanism that we believe will lead to more successful funded projects, and fewer stranded grants, strengthening Alberta's economic competitiveness with stronger companies and more innovative made-in-Alberta products and processes.

For a new technology to successfully advance to commercialization, the right market, policy and regulatory conditions need to exist.

STRATEGIC PRIORITY 2: DRIVE COMMERCIALIZATION

Engage with key audiences to build upon ERA's credibility as a convener across the innovation system

In 2020/2023 ERA will continue to provide the Government of Alberta and the Canadian Energy Centre with project information, facts, and success stories to support their goal of increasing the global understanding of this sector's value. We will also work with industry and innovator groups, and other funding partners (e.g., SDTC, COSIA, TEC Edmonton, Alberta Innovates, NGIF, etc.) to align around shared communications objectives. Communications outreach will continue to include a focus on large final emitters, relevant associations, innovators, venture capital organizations and trusted partners to be sure they are clear on ERA's role as a funder and as a convener of resources that can help innovators move their proven technology toward commercialization as quickly as possible.

Twice a year, we will host Lessons Learned events focused on past funding Challenges. Delegates will hear from project proponents and their partners about barriers to accelerating late-stage technologies and how they were overcome. Hosting these events helps us develop a stronger content strategy to share these learnings with those who may be able to innovate faster as a result of this knowledge translation. If required, ERA will adapt, and host Lessons Learned virtually to maintain business continuity during the COVID-19 pandemic.

Action 3: Advising government, where appropriate, on policies and regulatory frameworks to stimulate adoption of clean technology solutions.

For a new technology to successfully advance to commercialization, the right market, policy and regulatory conditions need to exist. Policy mechanisms, such as Alberta's TIER program can spur the advancement of technologies that help achieve desired environmental outcomes while growing our economy.

Alignment with provincial and federal regulatory mechanisms is essential to our success. ERA collaborated with the Alberta Energy Regulator (AER) on the development of both our Methane and Oil Sands Innovation Challenges. Equally important, AER is engaging with ERA's Methane Challenge recipients to ensure regulation is not a barrier to developing and deploying technologies to monitor, detect, and reduce methane emissions.

Going forward, ERA will continue to engage and collaborate with regulators and policy makers to support the design of each Call for Proposals. We will also work with these key stakeholders on an ongoing basis to help ensure policy and regulation are enablers of innovation and technology deployment, rather than barriers.

For example, to inform the scope of the Natural Gas Challenge, ERA hosted a workshop and a webinar that included innovators, industry, government, and other experts to discuss opportunities to decrease emissions, increase competitiveness, and tackle barriers to advancing technology. This funding opportunity will unlock innovation across Alberta's natural gas value chain by supporting clean technology projects that reduce GHG's, including upstream, midstream, and downstream operations.

STRATEGIC PRIORITY 3:

Maximize Impact

Maximize our impact through leveraged funding, communications, operational excellence, and by measuring and reporting on key performance metrics.

ACTIONS

1. Engage with key audiences to build upon ERA's role as an accelerator of GHG-reducing technologies that can lower costs and support continued growth in Alberta's economy.
2. Develop clear and succinct clean technology success stories that are so compelling that all stakeholders want to share them.
3. Ensure the Government of Alberta leverages ERA's success stories, lessons-learned, and outcomes to demonstrate how investment in innovation and technology is helping to grow businesses and reduce GHG emissions in Alberta's energy sector and throughout the economy.
4. Maximize and leverage shared investment capacity and expertise.
5. Build a stronger performance management approach that allows ERA to measure how we are performing and continuously improve on our deliverables.

OBJECTIVES

- ▶ Demonstrate progress on our Strategic Priorities and how we are contributing to broader provincial priorities such as emission reduction and economic growth
- ▶ Increase awareness of ERA's role within the innovation system
- ▶ Enable the Government of Alberta to achieve its strategic communications outcomes and objectives related to the economy and the environment
- ▶ Leverage investments to create larger pools of capital for innovation and technology
- ▶ Continue to refine ERA's impact management framework, including development of a robust balanced scorecard to communicate actual results against agreed upon targets. Additional measures to be developed supporting alignment with global Sustainable Development Goals (SDG) and return on investment (ROI)
- ▶ Increase operational effectiveness and efficiency in ERA's decision-making cycle.

STRATEGIC PRIORITY 3: MAXIMIZE IMPACT

IMPACTS

- ▶ Increase awareness in ERA's ability to support Alberta's action on climate change
- ▶ ERA's trusted partners and key stakeholders understand our processes, role and impact; benefit through lessons-learned from project execution, and remain our champions
- ▶ Demonstrate innovation and clean technology leadership and partnership through active leverage of collaboration and funding
- ▶ Efficient and effective use of public funds to help maintain competitiveness and stimulate deployment of GHG-reducing technology.

KEY MEASURES



STAKEHOLDER AWARENESS AND
COLLABORATIVE PARTNERSHIPS



ENGAGEMENT WITH PROPONENTS LED TO
FOLLOW-ON BUSINESS



ERA NET PROMOTER SCORE



OPERATING COSTS AS A PERCENTAGE OF
APPROVED PROJECT COMMITMENTS



LENGTH OF ERA INTAKE, DECISION MAKING
AND CONTRACTING CYCLE



LEVERAGED INVESTMENT



RETURN ON INVESTMENT



PERCENTAGE OF PROJECTS ADDRESSING
GLOBAL SUSTAINABLE DEVELOPMENT GOALS

STRATEGIC PRIORITY 3: MAXIMIZE IMPACT

Action 1: Engage with key audiences to build upon ERA's role as an accelerator of GHG-reducing technologies that can lower costs and support continued growth in Alberta's economy.

A robust communications strategy is critical to successfully delivering on our mandate and on the government's desired outcomes. ERA's 2019 stakeholder research showed our mandate has significant support amongst key stakeholders, yet there is an opportunity to increase awareness of ERA's role as an accelerator of GHG-reducing technologies nationally and internationally. Our 2020/2023 Communications Strategy is informed by this research.

In 2020/2023, we will continue to raise awareness of ERA's mandate and make certain our unique value proposition is clear to our key stakeholders. We will do this by putting a greater focus on storytelling through our content strategy that spans all ERA communication platforms, including our website, social media channels, annual report, stewardship reports, strategic events, and podcast series. ERA stories, in all of these formats, can be leveraged by organizations (e.g., Canadian Energy Centre) who need to share Alberta's broader climate action story.

Each year, the ERA team will participate in up to 30 strategic events. At approximately 20 of the events, we will seek out speaking roles to share the ERA story with audiences we cannot always reach through traditional communication channels. During the COVID-19 Pandemic, many events are being cancelled, postponed and transitioned to virtual platforms. ERA will continue to participate in conferences and workshops virtually, where and when it is appropriate. We anticipate larger conferences, which would have more difficulty switching to a virtual platform, will reschedule their events later in 2020 and into 2021. While this may result in a condensed business conference schedule, the ERA team will continue to participate in and attend these important events.

To maintain momentum from ERA's biennial conference, SPARK, we will launch the SPARK Speaker Series in 2020, with the intent to once again host more than 600 delegates at SPARK 2021.

ERA is proactive in its communication approach, meaning we are always watching for and leveraging communication opportunities that emerge—through partnerships, events, or media relations opportunities (targeted media include scientific journals with global reach).

Action 2: Develop clear and succinct stories that are so compelling that all stakeholders want to share them.

We intend to use storytelling to spur further innovation and technology interest. In 2020/2023, ERA will put an increased focus on storytelling, to proactively share successes through podcasts, videos, newsletters, proactive media relations and events that feature the "humans behind the innovation."

In 2020, ERA will release Ten Years of Innovation, a public relations campaign to showcase Alberta's strategic and purposeful carbon policy. The campaign will focus on ERA's 10-years of success reducing GHG emissions and increase visibility on a provincial, national and international level.

STRATEGIC PRIORITY 3: MAXIMIZE IMPACT

Action 3: Enable the Government of Alberta to leverage ERA's success stories, lessons-learned, and outcomes to demonstrate how investment in innovation and technology is helping to grow businesses and reduce GHG emissions in Alberta's energy sector and throughout the economy.

Though it is important for all Albertans to understand that the province is working to mitigate climate change, it is not necessary for Albertans to be familiar with the ERA brand. It is, however, critical that ERA provides the Alberta Government with the facts, actions, and outcomes that are proof points for Alberta's broader narrative on climate action. In 2020/2023, ERA will continue to provide the Province's senior officials, departments and agencies with relevant and timely information about ERA's unique value proposition, success stories and contributions to GHG reductions and economic growth, and offer government the opportunity to leverage ERA's actions.

Action 4: Maximize and leverage shared investment capacity and expertise.

Government plays a key role in developing and commercializing clean technologies and innovation through investments. Leveraged investment refers to additional funding from other sources and partners for every dollar invested. ERA project funding is leveraged, and we require that every ERA dollar invested is at least matched by private resources. In practice, we find on average that for every dollar we invest in a project, more than another \$5.90 are also invested by industry, innovators and other project funders.

Actively seeking out funding partners who desire similar outcomes as ERA can help maximize the value of our investments, allowing for significant and sustained resources to support advancement and commercialization of innovation and clean technology. This leverage is particularly important in the Alberta context where advancing, scaling and commercializing novel energy technologies can cost hundreds of millions of dollars. Companies are often looking for the validation that ERA funds provide to be a catalyst for further private investment.

Recent federal budgets have included numerous funding programs to support clean technology, including the NRCan Clean Growth in Natural Resources Program, SDTC's SD Tech Fund, and Environment and Climate Change Canada's (ECCC) Low Carbon Economy Leadership Fund (LCELf). Where it makes sense to do so, ERA will continue to collaborate with Federal agencies to advance technology solutions for Alberta's industries. Private funders can also provide investment leverage, including:

- ▶ Evok Innovations, a cleantech fund that accelerates the development and commercialization of solutions for the environmental and economic challenges facing the oil and gas sector
- ▶ The NGIF, created by the Canadian Gas Association to support research, demonstration and deployment of innovation in the natural gas value chain.

STRATEGIC PRIORITY 3: MAXIMIZE IMPACT

ERA is actively leveraging its investment through co-funding of projects with trusted partner organizations under our Partnership Intake Program. The Partnership Intake Program has now been operating for a full fiscal year and investment through this stream totals over \$48.7 million of ERA funding to 13 approved projects valued at approximately \$1 billion.

Action 5: Build a stronger performance management approach that allows ERA to measure how we are performing against our deliverables and continuously improve.

Performance management is critical to demonstrating that ERA is delivering on its mandate and living its core values.

ERA is a well-established delivery agent of Alberta's climate change and economic policy, and our efforts are aligned with defined provincial, national and international metrics.

Measuring GHG Reductions

ERA currently quantifies and reports projected GHG emissions reductions that will be delivered by our projects.

We calculate two different but related emissions reductions projections for projects in our investment portfolio:

1. The first is the total GHG emissions reductions anticipated from each project directly. This value is provided by our project proponents and reviewed by ERA to ensure the basis and methodology for the estimate is sound.
2. The second metric is the market potential for GHG reductions. Market potential estimates the total emission reductions expected to occur should the technology be commercialized and adopted under forecast market conditions. A number of considerations and assumptions underpin this calculation, including policies and measures currently in place and arising from the successful commercial adoption of technologies into Alberta, GHG emissions intensity, the estimated market size, various economic indicators, and the lifespan of the technology.

ERA is also exploring the valuation of emission reductions estimated for the portfolio of ERA investments. This includes factoring in the social cost of carbon, such as additional environmental, economic, and human health costs, and accounting for the emissions reduced through ERA projects. By applying a cost-benefit analysis to ERA's investments and emission reduction estimates, we will be able to communicate a more complete story regarding the return on investment and economic value attributable to these estimates.

STRATEGIC PRIORITY 3: MAXIMIZE IMPACT

Performance Management Refinement

ERA currently communicates its success through a variety of means including our Annual Report, Stewardship Reports, Lessons Learned events, our biennial SPARK conference, and more recently, our podcast series, Carbon Copy. Ensuring responsible and effective stewardship of public funds requires ERA to track and report metrics in the past, yet as data manipulation and reporting becomes more advanced, additional initiatives are underway. ERA is seeking to further demonstrate to its stakeholders, a line of sight between its funding, technology commercialization activities, and market GHG emissions reductions. Ultimate outcomes that include:

- ▶ Developing and documenting a more robust set of performance metrics
- ▶ Contributing to local, national and international targets
- ▶ Developing additional communications tools for diverse audiences.

To demonstrate and communicate how we are delivering results, ERA is committed to establishing and reporting on portfolio-based performance outcomes and measures. ERA has developed a balanced scorecard with targets for various measures that communicate our results on key performance metrics for technology advancement, economic growth, environmental stewardship, and community engagement. These include:

- ▶ TRL progression
- ▶ Job creation and GDP impact
- ▶ Leveraged funds and Return on Investment
- ▶ Cumulative project and estimated market emission reductions
- ▶ Alignment with global Sustainable Development Goals
- ▶ Stakeholder awareness as well as our Net Promoter Score.

Tracking and reporting these metrics against agreed upon targets demonstrates a commitment to delivering a strong value proposition for ERA's investments.

While reduced GHG emissions are at the core of both ERA's mandate and Alberta's climate and innovation policies, they are not the only success metric. ERA's vision and Alberta's policy outcomes are aligned in striving to deliver a sustainable, resilient and competitive economy. ERA has broadened the suite of data that is collected and the metrics that are being reported for technology deployment and adoption, prompting stakeholders to envision scenarios where funded innovative technology is broadly commercialized.

STRATEGIC PRIORITY 3: MAXIMIZE IMPACT

Ongoing Operational Improvements

ERA has a responsibility to ensure ongoing operational improvements, including discretionary and operational expenditures. ERA strives to maintain a lean operational budget and we consistently seek opportunities to reduce costs for the organization.

Our 2018/2019 operating budget showed a reduction of close to 20 per cent from the approved 2017/2018 budget and the 2019/2020 budget reflected estimates for two full rounds of call activity. It is expected that ERA operating costs for 2019/2020 will be below the budgeted \$5.5 million by about 10 per cent, due to the deferral of the Natural Gas and the Food, Farming, and Forestry calls.

Since establishment in 2009, ERA's business needs have been carried out by a network of outstanding service providers and delivery partners contracted to carry out specific functions. In 2019, our operating costs represented just under two per cent of the total funds we invest, including payments to our service providers and contracted delivery partners.

However, every good business delivery model requires review and assessment to ensure it is providing the best possible value. During 2018 and 2019, ERA completed a request for proposals for two of its key service providers and will continue to systematically review the core services to ensure we are receiving the best value for money.

For the development of our 2020/2023 budget, ERA remains committed to efficient use of operating funds and service providers were advised not to increase per-unit service provider rates. This business plan will deliver a four per cent reduction from last years' proposed budget and ERA will continue its ongoing efforts to identify efficiencies and reduce costs. Service providers are also encouraged to identify further suggestions for operational cost savings to continue to deliver budgets that provide value for money. Any discretionary spending continues to be restrained.

ERA's rigorous and transparent funding process has a strong track record for identifying projects and technologies with high potential to decrease Alberta's GHG emissions and improve economic outcomes.

ERA continuously reviews and evaluates our intake process to seek opportunities to make the decision-making cycle more efficient, without sacrificing rigour or credibility. Our Partnership Intake Program also provides opportunities to improve the efficiency of our intake process.



Low-Carbon Fuels Project, Lafarge Canada

4.0 OPERATING BUDGET

2020/21 TO 2022/23 OPERATING BUDGET IN THOUSANDS

	2019/20 Budget \$	2019/20 Forecast \$	2020/21 Budget \$	2021/22 Budget \$	2022/23 Budget \$
Revenue					
Grant revenue	90,000,000	15,000,000	50,000,000	75,000,000	100,000,000 (a)
Interest income	8,447,599	7,879,744	3,993,704	2,103,824	1,303,002 (b)
Total Revenue	98,447,599	22,879,744	53,993,704	77,103,824	101,303,002
Project Expenditures	130,075,808	36,380,383	128,754,105	140,668,168	114,979,180 (c)
Revenue less Project Expenditures	(31,628,209)	(13,500,639)	(74,760,401)	(63,564,344)	(13,676,179)
Operating Expenses					
General & Administrative Expenses					
Corporate costs	206,655	258,009	266,315	271,641	277,074
Insurance	11,220	11,434	11,472	11,701	11,935
Total General & Admin Expenses	217,875	269,443	277,787	283,343	289,010 (d)
Management Expenses					
Project Adjudication	2,009,181	1,443,250	1,945,499	1,829,895	1,866,493
Contracts	276,441	338,744	261,200	255,569	260,680
Communication	1,188,503	1,135,301	1,067,860	1,324,674	1,351,168
Strategic	221,536	277,315	268,500	240,967	245,787
Corporate Administration	717,748	651,170	710,883	714,752	729,047
Governance	213,558	242,008	175,277	151,947	154,986
Total Management Expenses	4,626,967	4,087,789	4,429,220	4,517,804	4,608,161 (e)
Other Contracted Services and Special Initiatives					
Consulting contracted services	441,954	204,769	331,598	338,230	344,995 (f)
Spark Conference Costs	125,000	234,020	75,000	225,000	75,000 (g)
Total Other Contracted Services and Special Initiatives	566,954	438,789	406,598	563,230	419,995
Governance					
Board remuneration and expense	86,824	123,476	151,731	154,766	157,861 (h)
Professional fees	47,213	50,293	51,198	52,222	53,266
Total Governance	134,037	173,769	202,929	206,988	211,127
Total Operating Expense	5,545,833	4,969,790	5,316,534	5,571,365	5,528,292
Surplus / (Deficiency) of Funds for the year	(37,174,041)	(18,470,429)	(80,076,935)	(69,135,709)	(19,204,471)
Total Funds Under Management - beginning of year	372,091,970	402,571,328	384,100,899	304,023,964	234,888,255 (i)
Total Funds Under Management - end of year	344,917,929	384,100,899	304,023,964	234,888,255	215,683,784
Committed Funds for Approved Projects	680,766,138	607,039,047	682,039,047	772,039,047	870,039,047 (j)
Total Project Funds paid to date	(376,996,985)	(269,026,781)	(397,780,886)	(538,449,055)	(653,428,235)
Remaining Funds required to fulfill approved project commitments	303,769,153	338,012,266	284,258,161	233,589,992	216,610,812
Uncommitted Funds	41,148,776	46,088,633	19,765,803	1,298,263	(927,028)
Operating costs as a % of Funds Required to Fulfill Approved Project Commitments	1.8%	1.5%	1.9%	2.4%	2.6% (k)

Notes and assumptions

- (a) ERA received \$25 million grant allocation for 2019/20 and has extended the Grant agreement to March 2024. The amounts budgeted in the business plan represent current estimates of potential funding, however it should be noted that ERA can scale their calls for proposals and partnership intake program to fit within any funding envelope that is confirmed by the Government of Alberta. In addition, ERA has the flexibility to reallocate funds from approved projects that may not proceed to future funding opportunities.
- (b) Interest income has been based on cash flow projections for the Corporation and current interest rate assumptions forecast by ERA's investment advisors at CIBC. The interest consists of the operating account, business account, 50M GIC (1.20%) and another 300M Flexi GIC (1.25%). Current rates have decreased from 2.45% (business) and 1.65% (operating) to 0.95% (business) and 0.65% (operating) in the second quarter and no increases have been forecast for this budget cycle.
- (c) Program expenditures have been budgeted based on signed contribution agreements or on a set of assumptions regarding approved and anticipated funding for projects.
- (d) General and Administration Expenses budget has increased due to an increase in office lease costs to accommodate the expanded ERA team.
- (e) Total Management expense costs have been budgeted to increase from the current year forecast due to the expectation of two full calls (Call 6 and 7) along with the Partnership Intake Program (PIP). FY20 is only expected to have one full call with the PIP projects.
- (f) Other Consultant costs are estimated to be increased from the current year forecast to accommodate projects anticipated in fiscal 2021.
- (g) Spark Conference will be held November 2021. Costs for the current year represent the net investment for SPARK2019 held November 2019.
- (h) Board remuneration and expense' budget increase reflect the result of an engaging and diverse group of Board members both nationally and internationally.
- (i) Based on Cash flow model for the month ended December 31, 2019. Represents ERA's total funds under management.
- (j) Based on actual funding approved for remaining active projects in Round 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, Grand Challenge, Adaptation, Biological, Call 1, Call 2, Call 3, Call 4, Call 5, and assumptions for Partnership Intake. Future approved rounds are based on estimates. Funds are shown as committed once the EO cycle has started for a particular Call.

	\$
Round 1	54,443,172
Round 2	24,047,999
Round 3	10,000,000
Round 4	31,223,000
Round 5	4,093,569
Round 6	1,643,384
Round 7	25,375,135
Adaptation	6,990,662
Biological	4,050,627
Grand Challenge	30,518,740
Round 8	9,161,141
Round 9	7,358,671
Round 10 and Accelerator	56,002,917
Round 12 -SDTC Joint Call	12,181,402
Call 1 - Methane Reduction	25,688,096
Call 2 - Oil Sands Innovation	60,600,000
Call 3 - Industrial Efficiency	59,050,650
Call 4 - BEST Challenge	77,476,755
Call 5 - Natural Gas Value Chain	58,418,040
Partnership Intake	48,715,087
	607,039,047

Future Rounds	\$	
Call 6, 7 & 2020/21 Partnership Intake	75,000,000	Note: Includes forecast for funding calls and PIP
Call 8, 9 and 2021/22 Partnership Intake	90,000,000	Note: Includes forecast for funding calls and PIP
Call 10, 11 and 2022/23 Partnership Intake	98,000,000	Note: Includes forecast for funding calls and PIP

- (k) This metric represents total ERA Operating costs for the year as a percentage of the funds required to fulfill all remaining project commitments approved by the ERA Board of Directors. The relative percentage increases over the three year budget. The funds required to fulfill remaining commitments will be reduced as project payments continue to be made in accordance with the project plans, at a greater pace than new commitments are made.

APPENDIX

CALL ALIGNMENT WITH FOCUS AREAS

