EMISSIONS REDUCTION ALBERTA

$646 million invested

37.7 million tonnes of emissions reduced by 2030

$3 billion GDP impact in Alberta by 2024

22,000 person-year-jobs in Alberta by 2024

BUSINESS PLAN

2021 - 2024

PREFACE:

HOW EMISSIONS REDUCTION ALBERTA IS SUPPORTING ALBERTA'S COVID-19 RECOVERY

COVID-19 has impacted the way we live, work, and consume. The pandemic has, at least for now, changed how the world has done business. From the outset of this global disruption, Emissions Reduction Alberta (ERA) focused on responding to the economic turmoil COVID-19 caused, and ongoing instability of oil prices, and acted quickly to assist near-term recovery. Amongst unstable financial markets and economies globally, Alberta continues to be called upon to support long-term economic and environmental sustainability efforts.

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

The organization continues to assess its current funding and business model to identify creative solutions to support ERA's portfolio of companies as the Government of Alberta responds to the economic and COVID-19 disruptions. The team is engaging with funding partners across the innovation system to ensure actions are aligned and complementary.

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

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Message from the Chair

This past year has reinforced the need for the public and private sectors to be agile and adaptive. In 2020, ERA demonstrated its agility as the team quickly reacted and responded to the near-term challenges posed by the COVID-19 pandemic and volatility in oil prices. This nimbleness has positioned ERA to contribute to economic recovery by executing the rollout of stimulus funding fully aligned with our mandate: reducing greenhouse gas (GHG) emissions, while growing Alberta's economy through the development and adoption of innovative technology solutions.

Notwithstanding these challenges, we remain aligned and focused on where we need to go in the future. Prioritizing technology and innovation today continues to be the key to unlocking tomorrow's opportunities.

The funds entrusted to us in 2020, by the Government of Alberta through the Technology Innovation and Emissions Reduction (TIER) regulation and by the federal government's Low Carbon Economy Leadership Fund (LCELF), recognize ERA's credibility and successful track record. Moving forward, executing on this commitment of funds from both the provincial and federal governments will unlock the development and deployment of technologies needed to stimulate today's economy, build on this foundation to create economic opportunities for the future, and continue to drive greenhouse gas emission reductions in Alberta.

Our vision is to enable Alberta and Canada to achieve a low carbon future, while contributing to a competitive Alberta economy that attracts investment and creates jobs. Our Technology Roadmap is the foundational strategic document that guides our investments and portfolio mix. It positions Alberta in the broader global and national context, while also giving due consideration to regional opportunities, challenges and priorities. Most importantly, it outlines key technology areas that will enable Alberta to reach its environmental and economic objectives and guides decisions on ERA's investment in technology and innovation. In 2021, we will undertake a review of this Roadmap to ensure it reflects the ever-changing and dynamic global context, identifies the key opportunities and challenges for Alberta, and positions the ERA investment portfolio in a manner that will ensure we realize our objectives. To that end, this review will help us make certain we are investing in the optimal short-, mid- and long-term opportunity portfolio, and that we have the necessary flexibility to adapt to what will inevitably be an uncertain path to the transformation of our energy system on the journey to a low carbon future.

We have long recognized that ERA cannot operate in isolation, and that we need partnerships and strategic alliances to both stimulate today's economy and to create the low emissions economy of the future. Leveraging investment capacity on provincial, national, and international levels will be integral to scaling-up capital-intensive technologies and accelerating the pace of innovation. This year, we will further develop and refine our strategic partnerships, with an increased focus on international collaborations.

Critically important to our mandate is ensuring the activities ERA has committed to undertake are scalable (up or down). Our highly efficient and flexible business model allows us to be very responsive to changes in the total funding available for investment.

I am pleased, on behalf of our Board, to present ERA's 2021/24 Business Plan. I have great confidence in the commitment and capacity of ERA's executive and staff to deliver the results outlined in this Plan.

Sincerely,

Dave Collyer
Chair, Emissions Reduction Alberta

Message from the CEO

ERA's 2021-2024 Business Plan has been informed by stakeholders spanning government, industry, academia, and the broader innovation system. Gathering advice and diverse perspectives helps us ensure we have a plan that is aligned around the right priorities and will accelerate technology development, drive commercialization, and maximize our impact.

Today, jurisdictions around the world are reinforcing the need for continued investment in emissions-reducing technologies that support economic recovery, improve environmental performance, and build market confidence. As we steer our way through the COVID-19 pandemic, ERA is aligned with this approach, creating new opportunities to deliver the technology solutions the world needs.

Last year, the Province remained committed to using the carbon price paid by large emitters to identify and scale up emissions-reducing innovation. A record amount of funding from the TIER fund will be invested through ERA to de-risk promising technologies.

For over 10 years, ERA has been punching above its weight. As an independent organization, we have been a key partner and convenor, helping Alberta achieve its environmental and economic goals by stewarding investments and project progression along the innovation continuum. Since we were established in 2009, we have committed $646 million to 204 projects worth $4.5 billion. We are on track to deliver cumulative GHG reductions of nearly 38 million tonnes by 2030. These investments will also lead to almost 22,000 jobs being created by 2024 and contribute over $3 billion to Alberta's GDP. Going forward, I believe this work is more important than it has ever been.

Beginning this year, through our focused funding challenges and our Partnership Intake Program, we will rollout $280 million in funding to support economic recovery. Our work will also include an expanded mandate and team as we execute our new Energy Savings for Business (ESB) Program, which will help accelerate market adoption of GHG-reducing technologies for small and medium-sized industrial and commercial businesses. Additional investments will help transform our energy systems, promote a circular economy, and leverage Alberta's advantages to produce the fuels of the future, including a focus on low-carbon hydrogen, geothermal, capturing carbon through both engineered and nature-based solutions, and more.

ERA remains a responsible steward of public funds. The organization's ability to deliver its operations as effectively and efficiently as possible has always been a guiding principle. This year, like every other since 2009, ERA will identify cost saving opportunities through learning and continuous improvement. ERA will also evolve how it tracks and reports performance metrics that demonstrate a line of sight between funding, technology commercialization activities, and market GHG emissions reductions. Important work for 2021/24 will be incorporating success indicators for ERA's expanded mandate, including the new ESB Program.

Going forward, ERA's unique value proposition, and extraordinary accountability framework will allow us to accelerate the technology pathways that will be critical to Alberta's success now and into the future.

Sincerely,

Steve MacDonald

CEO, Emissions Reduction Alberta

1.0 BUSINESS PLAN AT A GLANCE

In a difficult economic environment, Alberta is facing the challenge of trying to support economic recovery and improve business and industry competitiveness while also reducing its GHG emissions.

ERA is well positioned to help Alberta achieve its policy and economic goals. ERA continues to identify and invest in opportunities to accelerate innovation and attract the investment required to improve Alberta's environmental performance and strengthen and diversify its economy. The investments we are making today will enable the innovation that will unlock longer-term opportunities for the province.

This 2021/24 Business Plan sets out the actions ERA will take to deliver on its mandate. The plan is scalable and ERA's flexible business model enables the organization to strike the right balance, responding to government and industries short-term needs while continuing to deliver on longer-term strategic outcomes. Critical among these actions will be the successful delivery of important funding calls that were launched in 2020, including the $40 million Food, Farming and Forestry Challenge and the $150 million Shovel-Ready Challenge. Looking forward, ERA will seek to deliver new competitive funding opportunities. Examples of potential focus areas for future Calls for Proposals could include:

- Fuels of the Future
- Circular Economy
- Transforming Energy Systems.

Annual Calls for Proposals will be augmented by ERA's Partnership Intake Program—a flexible mechanism for ERA to fund innovative projects that are brought forward by trusted funding partners* in the innovation system. The organization will also implement its new Energy Savings for Business Program. In 2021/24, ERA will continue to convene the resources required to accelerate the adoption of technology solutions. This includes the completion and evaluation of its Innovator Support Pilot, as well as continued development of the trusted partner network to support scale-up, adoption, growth, and export of made-in-Alberta solutions.

* View a list of our Trusted Partners on page 20

STRATEGIC PRIORITY: **ACCELERATE TECHNOLOGY**

OBJECTIVES

- Attract the best quality project applications for 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.

ACTIONS

- Use the Technology Roadmap (TRM) to ensure ERA investments are responsive to evolving needs of industry and innovators
- Commit to one new call for proposals and ensure additional competitive funding opportunities are in place
- Support the execution of Clean Resource Innovation Network's (CRIN) next funding competition aimed at reducing emissions
- Ensure timely review of promising projects or technologies referred by trusted partners through the Partnership Intake Program.

STRATEGIC PRIORITY: **DRIVE COMMERCIALIZATION**

OBJECTIVES

- Increase commercialization and market adoption of emissions-reducing technologies
- Enable technological learnings and knowledge-sharing to help accelerate commercial deployment of GHG-reducing technologies
- Measurable jobs, GDP creation, and economic benefits created in Alberta
- Increase recognition of Alberta as an innovation and clean technology leader and strong environmental steward.

ACTIONS

- Commit up to $150 million to new projects under the Shovel-Ready Challenge
- Refresh the TRM to ensure ERA is investing in the right balance of technologies Alberta will need in the short-, medium-, and long-term
- Implement the new Energy Savings for Business Program to accelerate uptake of commercially available emission-reducing technologies
- Grow our trusted partner network to enhance opportunities for collaboration, partnership, and deal flow
- Build a larger network of international partnerships and strengthen relationships to raise the profile of projects and technologies globally
- Complete and evaluate the Innovator Support Pilot Program
- Leverage SPARK and Speakers Series to raise awareness of ERA, our funded projects and our collaboration within the innovation system.

STRATEGIC PRIORITY: **MAXIMIZE IMPACT**

OBJECTIVES

- Demonstrate ERA's contribution and support to provincial policy priorities, including emission reductions and economic growth
- Increase awareness of ERA's role within the innovation system
- Support the Government of Alberta to achieve strategic communications objectives related to the economy and environment
- Leverage investments to create larger pools of capital for innovation and technology
- Refine ERA's impact management framework
- Increase operational effectiveness and efficiency in ERA's decision-making cycle.

ACTIONS

- Deliver story-based content strategy across communication platforms and provide to the Government of Alberta as proof points for success
- Make sure processes and practices meet the needs of innovators
- Develop a plan to improve equity, diversity, and inclusiveness of program access and internal operations
- Strengthen performance measures and reporting outcomes to support continuous improvement and demonstrate success and impacts of our investments
- Continue to seek opportunities to leverage innovation ecosystem funding to maximize impact
- Identify and implement operational efficiencies and cost reductions.

*Clean technology defines a set of technologies that either reduce or optimize the use of natural resources, while simultaneously reducing the negative effect that technology has on the planet and its ecosystems.

2.0 ABOUT THE ORGANIZATION

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.

On January 1, 2020, the Government of Alberta implemented its new 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 CO_2e. 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 competitive industries that deliver sustainable environmental outcomes, attract investment, and build a diversified, lower carbon economy.

Lafarge Canada - Low Carbon Fuels Project

VALUE PROPOSITION

ERA invests the proceeds from carbon pricing paid by large industrial emitters to reduce GHGs and strengthen the competitiveness of new and incumbent industries in Alberta. 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.

ERA delivers results through a competitive, transparent, efficient, and outcomes-focused delivery model.

CORE VALUES

INNOVATION

COLLABORATION

TRANSPARENCY

INTEGRITY

MEG Energy

STRATEGIC PRIORITIES

ERA has established three key strategic priorities that provide the framework to deliver on its mandate:

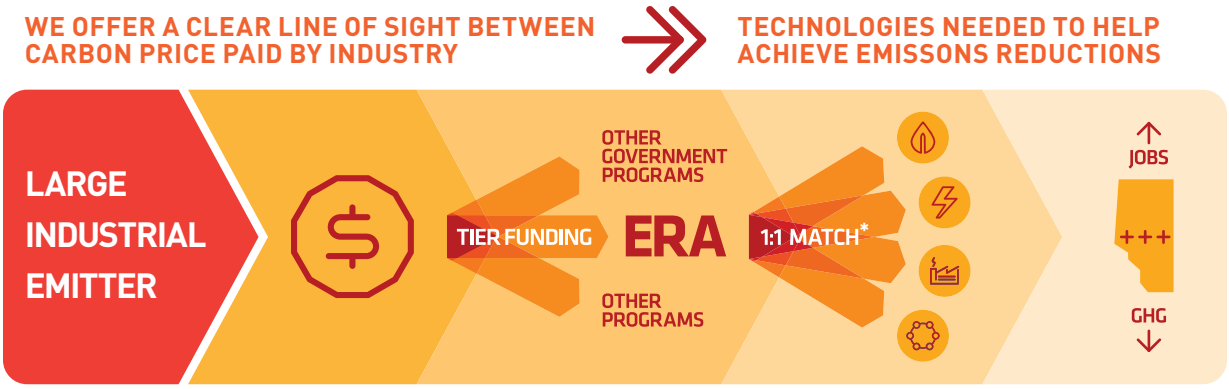
1. **Accelerate Technology:** Invest in GHG-reducing technologies that help Alberta grow existing industries and create new ones.
2. **Drive Commercialization:** Convene the resources required to accelerate the adoption of technology solutions that lead to economic growth and GHG reductions in Alberta.
3. **Maximize Impact:** Through leveraged funding, communications, and operational excellence.

BUSINESS MODEL

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

- It offers a clear line of sight from the carbon price paid by industry, under the TIER regulation, to investment in the solutions needed to help achieve emissions reductions. ERA's primary source of funding comes from the Government of Alberta, by way of a Grant Agreement, made possible by revenue within the Technology Innovation and Emissions Reduction Fund.
- Funding later-stage technology means ERA is accelerating projects toward broader industry deployment and adoption by helping to de-risk projects in the crucial pilot, demonstration, and scale-up stages of development.
- Non-dilutive* grant funding helps to accelerate clean technologies through development stages where private industry and financial institutions are reluctant to invest due to technology risk.
- Its Delegated Administrative Organization (DAO) structure means ERA has no annual investment caps, it can fund multi-year projects, it can carry funding over from year-to-year, and it can take back and reinvest funds when projects do not progress.

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

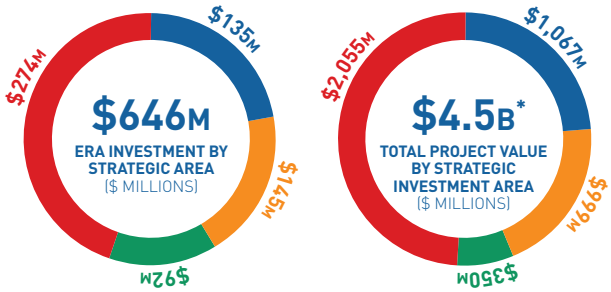


*1:1 matching is ERA's minimum requirement. For every dollar invested by ERA, $5.90 is invested by industry, innovators, and other project funders.

Investing in a Diverse Portfolio

204 Projects Total

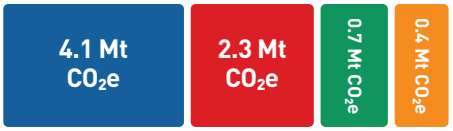
- Cleaner Oil & Gas (72 Projects)
- Low Emitting Electricity System (25 Projects)
- Food, Fibre, & Bioindustries (58 Projects)
- Low Carbon Industrial Processes & Products (49 Projects)



*Total Project Value includes ERA, industry, and other sources of funding.

Cumulative Project Emission Reductions*

7.5 Mt CO_2e Total by 2020



37.7 Mt CO_2e 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, emissions reduction estimates may change materially.

Creating Jobs and Diversifying the Economy

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	GDP IMPACT TO ALBERTA BY 2024
22,000	$3 BILLION

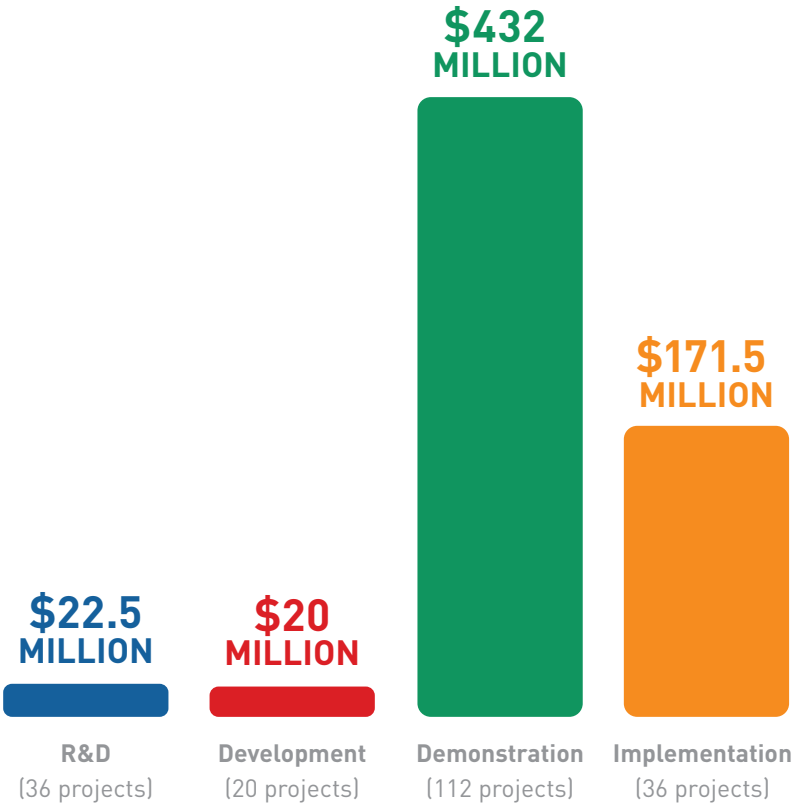
CANADA

PERSON-YEAR* JOBS IN CANADA BY 2024	GDP IMPACT TO CANADA BY 2024
30,000	$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 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 by 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.

GOVERNANCE AND BOARD

ERA is a not-for-profit that reports to an independent Board of Directors. While an independent organization, ERA remains accountable to the Government of Alberta through the Technology Innovation and Emission Reduction Fund Regulation, a Memorandum of Understanding and Grant Agreements, which include two main reporting requirements to the Minister and Department of Environment and Parks:

1. Corporate Business Plan that outlines strategies for ERA to achieve its goals and objectives and must be submitted by the end of April.
2. Annual Report with respect to ERA's performance submitted by the end of November.

In addition to its governance and strategic oversight role, ERA's Board of Directors through the approval of the business plan and other documents such as the Technology Roadmap, provides important advice to help inform Alberta's overall efforts to achieve its environmental and economic objectives. With diverse backgrounds that include industry, government, academia, and the not-for-profit sector, the ERA Board provides tremendous expertise and leadership.

ERA BOARD MEMBERS

Dave Collyer *(Board Chair)*
Joseph Doucet *(Vice-Chair)*
Céline Bak
Vittoria Bellissimo
Corrina Bryson
Johannes Dyring
Ronda Goulden
Sara Hastings-Simon
Clive Mather
Patricia Mohr
David Moss

CarbonCure Technologies - Grand Challenge Funding Recipient

3.0 DELIVERING ON STRATEGIC PRIORITIES

ERA's operations and the funding of technology development are primarily made possible through a Grant Agreement with the Government of Alberta. ERA has also received a funding commitment from the federal government, in coordination with the Government of Alberta, through the Low Carbon Economy Leadership Fund (LCELF) to augment funding calls. ERA's current grant agreement with the Government of Alberta is in place until 2024. However, most of the funding associated with the current agreement is committed toward solving technology challenges that are more short-term in nature, looking for opportunities that allow industry to do the same things better. At the time of the development of the 2021/24 Business Plan, confirmation of future grant amounts or the timelines for decisions on future funding are still unclear.

ERA has designed the plan to reflect the uncertainty of future funding from the Provincial Government. The activities ERA has committed to undertake in this plan are scalable. The 2021 actions are made possible as a result of receiving $180 million from the Provincial Government, granted on December 18, 2020, and up to $100 million from the Federal Government. Through prudent financial management, ERA will strive to make an additional $50 million available for a funding challenge in 2021. Beyond 2022, however, ERA will need to receive additional funding to invest in new technology opportunities in the focus areas outlined in this plan.

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.

ERA will continue to work closely with the Government of Alberta to identify opportunities to accelerate the innovation and investment required to improve Alberta's environmental performance and to strengthen and diversify its economy. ERA will also foster and build its relationship with the Federal Government to seek additional opportunities to leverage additional resources to maximize the impact of Alberta's investments.

"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."

STRATEGIC PRIORITY 1

Accelerate Technology

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

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.

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 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

ACTION 1:
Invest in projects that align with ERA's Technology Roadmap and support Alberta's economic and environmental priorities

ERA's investments are guided by its Technology Roadmap (TRM) —a living document that ensures the organization remains responsive to the evolving needs of Alberta's industries and innovators within a changing global context.

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 ITS 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.

3.0 DELIVERING ON STRATEGIC PRIORITIES

The past year has seen significant investments by all levels of government and industry in clean technology that supports job creation, economic recovery, and environmental sustainability. At the same time, jurisdictions around the world have recognized the need to expedite action to reduce emissions and are increasingly making commitments to achieve net-zero by 2050. In 2021, ERA will undertake a review of its TRM to make certain ERA has the right portfolio balance, investing in technologies Alberta will need in the short-, medium- and long-term. ERA's investments, such as the Shovel-Ready Challenge and the ESB Program, will provide immediate return on investment through the creation of jobs and delivery of environmental benefits. In 2021, ERA will also work closely with the Clean Resource Innovation Network (CRIN) to design and launch a $50 million competition focused on reducing the environmental footprint of the oil and gas sector. CRIN is a pan-Canadian network focused on ensuring Canada's energy resources can be sustainably developed and integrated into the global energy supply. Funding for this challenge will come from a broader $100 million award to CRIN from Canada's Strategic Innovation Fund (SIF).

As ERA contemplates future funding calls and adjusts its TRM, it will take a balanced approach to investing in future innovation. This includes continued support for innovative technologies and solutions that decarbonize and improve efficiencies in existing industries, while also looking for opportunities to investing in longer-term technology bets, that may come with higher risk, but remain critical to achieving climate commitments and diversifying the economy.

Orion Plastics

ACTION 2:
Fund later stage, innovative technology solutions

ERA's funding will be made available primarily through the delivery of targeted, competitive funding challenges, and ERA's Partnership Intake Program. Accelerating and de-risking later-stage GHG-reducing technologies requires significant capital investment.

In 2020, ERA launched its Shovel-Ready Challenge; a $150 million funding competition providing vital financial support to companies ready to implement leading-edge technologies for both greenfield and brownfield operations. In 2021, successful applicants from the Expression of Interest phase will be invited to submit a Full Project Proposal for review. A key requirement for applications is the ability to begin implementing their project within 60 days of approval. In the 2021/24 Business Plan, ERA will also continue to invest funds in promising emission reduction projects referred through its Partnership Intake Program. The program was recently recapitalized through government grants, which included up to $75 million encompassing $50 million from the Government of Alberta's TIER fund and up to $25 million from the Federal LCELF.

As ERA continues to support the commercialization of innovative, emission-reducing technologies, the organization is looking ahead to further address industry innovation needs in Alberta. The following section identifies three specific areas of interest. These potential focus areas have been informed by government and industry priorities, stakeholder engagement activities held in 2020 and 2021, along with guideposts laid out in ERA's Technology Roadmap.

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

FUELS OF THE FUTURE

The International Energy Agency produces a World Energy Outlook that provides a comprehensive set of scenarios on how the global energy system could develop in the coming decades. According to their 2020 outlook, all scenarios continue to suggest that global demand for liquid hydrocarbons—as fuels for transport, as petrochemical feedstock, for electricity generation and other uses—will continue to challenge our ability to increase the pace of emissions reductions needed to meet national and international climate change objectives. These products have an unrivalled energy density and are easy to transport, making them an ideal means to carry and store energy. While alternatives are being developed for some of their current uses (e.g., in passenger cars, where electrification is expected to play a major role), liquid hydrocarbons remain difficult to replace in heavy-duty and marine transport, in aviation and as a feedstock for the petrochemical industry. Canada recently released the Clean Fuel Standard, currently requiring liquid fossil fuel primary suppliers to reduce carbon intensity of their fossil fuels from 2016 intensity levels. This will require investment in innovative technologies and solutions that improve processes and aid in the advancement of low or zero-carbon fuels.

Alberta can be a leader in the shift to lower emissions fuels by capitalizing on its current industry, infrastructure and resource base. Development of a suite of low

carbon fuels and energy carriers will improve the diversity and resilience of the economy and provide flexibility to industry and other users to select the optimal solutions for their sector. Propelling the transition to lower carbon fuels requires the development of key areas such as their production, distribution, storage and use, while also supporting the infrastructure to enable the longevity of these new opportunities.

ERA sees biofuels as an important opportunity area. This includes improvements to first- and second-generation biofuels (e.g., biodiesel, bioethanol) and development of third and fourth generation biofuels (e.g., algae fuels, solar fuels). Other fuel alternatives include electricity (e.g., developing hybrid or electric vehicles), decarbonized natural gas, hydrogen, and nuclear fuel. These fuels of the future require resource investments, and a parallel development of enabling technologies and solutions to bring down the cost and help meet future supply and demand. For example, hybrid and electric vehicles must improve in efficiency and cost for widespread adoption, charging stations must be easily accessible, and additionally, electricity production must be able to meet the growing need (i.e., the current grid system must increase its capacity, or development of community generation must be integrated to support this shift).

Another important opportunity for Alberta is related to hydrogen production. Alberta's vast hydrocarbon reserves and renewable energy resources position the province to be one of the lowest cost producers of hydrogen fuels in the world. The Government of Alberta's Natural Gas Strategy identified hydrogen deployment in areas such as transportation, home-heating, and fuel blending as important pathways for helping Canada meet its climate goals.

While hydrogen has tremendous potential to become part of the decarbonization solution, production from hydrocarbon feedstocks will require parallel development and deployment of CCS technologies to achieve the environmental benefit (reduced emissions) that make the fuel an attractive and viable solution. CCS technologies are also an important technology, overall, for decarbonizing existing industries and energy systems.

Key opportunities to both lower the cost and increase the viability of future fuels, include:

- Technologies that enhance the market competitiveness of future fuels by improving efficient production, storage, and distribution
- Electricity as a fuel replacement
- Hydrogen, including when produced from natural gas where carbon is captured and either stored or utilized
- Ammonia, synthetic and biofuels.

Many projects are expected to emerge in this area and ERA remains well positioned to continue supporting the development of future fuels.

CIRCULAR ECONOMY

Transforming the economy to fit within the boundaries and natural limits of the planet is a huge challenge, but it also presents massive opportunities to capture the full value of resources produced.

The shift towards circular economy approaches will help eliminate waste, maximize value and regenerate natural systems by keeping resources and manufactured materials in the economy for longer by improving, and in some cases transforming, how goods and services are designed, manufactured, and used.

Establishing a genuine circular economy includes capturing the value of resources not only downstream through recycling and recovery, but in the upstream stages of the product lifecycle as well. Changes to upstream activities such as harvesting raw materials, product design, manufacture and transportation can help accomplish this. Additionally, repurposing current infrastructure assets will help enable an effective transition.

Alberta is looking into advancing new, expanded and circular pathways in areas such as petrochemical manufacturing and CO_2 conversion to value-added products, and is also finding new uses for its current infrastructure such as looking into its abandoned oil wells for potential geothermal energy development and using its pipeline network to transport alternative fuels. Creating new and expanding existing value chains in this way contributes to promoting a circular economy.

Alberta's Natural Gas Strategy leverages the province's historic strengths in meeting demand for emerging market opportunities and enabling new business ventures. Alongside creating these economic benefits, a more circular economy will contribute to the reduction of GHG emissions. In an analysis done by Deloitte regarding the potential to save emissions in the European Union by recirculating materials and products, key sectors may be able to reduce emissions anywhere from 13 per cent to 66 per cent (Deloitte, 2016).

Maximizing the use of materials and resources will contribute to efficiency gains and reduce the need to rely on continued production, thereby further reducing associated emissions. Some key opportunities for improvement and potential technologies and solutions can be found in these areas:

- Advanced petrochemical manufacturing
- Augmenting the sustainability and circularity of Alberta's food, fibre and bioindustries (e.g., sustainable beef production through new feed solutions and efficiency improvement in farm operations)
- CO_2 conversion to value-added products that create new markets
- Repurposing oil and gas assets (e.g., exploring oil wells for geothermal development, using pipelines for alternative fuel transport)
- Bitumen beyond combustion
- Solutions to reduce energy inputs through recycling and reuse of materials
- Recovery of resources and energy from waste streams.

With Alberta's goal to become the Western North American centre of excellence for plastics recycling by 2030, the province is demonstrating its commitment to circularity. ERA has provided support for many waste-to-value-add projects in

its portfolio and continues to look for promising projects via its recent challenges including the BEST Challenge, Natural Gas Challenge, Food, Farming and Forestry Challenge, and Shovel-Ready Challenge, as well as through its Partnership Intake Program via ERA's network of Trusted Partners. Transitioning to a more circular economy is a large feat that requires all levels of government and industry to work together, creating policies, regulations and investment opportunities. With the World Circular Economy Forum 2021 set to be held in Toronto in September 2021 -- the first time the conference will be held in North America -- there remains great opportunity for Alberta to demonstrate leadership in advancing circular products and solutions for the diversification and sustainability of its industries and showcase their export potential.

TRANSFORMING ENERGY SYSTEMS

Industries are increasingly looking at saving costs and being more efficient to remain competitive in an increasingly interconnected, global marketplace. ERA is already playing a role in this transition by dedicating up to $55 million to the new Energy Savings for Business Program, which will enable rapid deployment of commercialized technologies to reduce emissions and save costs. However, transforming Alberta's energy systems will require more than just reducing costs and increasing efficiencies; the province needs to address new challenges, such as integrating growing generation of renewable power, or the increased electrification of end-use sectors of transport, industry and buildings. Integrating digital technologies such as Artificial Intelligence, machine learning and analytics, while offering solutions that can be tailored to individual situations and needs, will increasingly become commonplace in worldwide energy systems.

Deployment of advanced energy management and energy storage systems (e.g., fuel cell and battery systems) will also play an important role in helping create a more flexible and reliable energy system.

Ensuring Alberta can reduce GHG emissions while maintaining its high standard of living and growing its economy will require development and deployment of innovative solutions to decarbonize and digitize its energy systems. In 2018, Alberta's electricity sector emitted over 32 Mt CO_2e, half of Canada's total emissions from the electricity sector (64 Mt CO_2e) while combined emissions from buildings, transportation, electricity generation, and waste sectors amounted to 90Mt CO_2e. The integrated nature of these sectors provides a great opportunity to deploy new and innovative solutions that will both reduce emissions and save costs. ERA funding could further play a role in accelerating opportunities, including:

- Improved energy use through advanced energy management systems
- Integration of low emission and distributed generation (e.g., renewables, small modular nuclear reactors, energy storage)
- Innovative building construction using green materials and inputs
- Grid optimization and digitization (e.g., smart meters, sensors, etc.)
- Autonomous vehicles and improved fleet management.

While Alberta works to ensure its policies and regulations continue to enable sustainable grid modernization, various technology opportunities present themselves. For example, 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 technologies and fuel cells. Some of these technologies and solutions present small, near-term reduction opportunities that also will lead to larger emissions reductions in the future because they enable more efficient and flexible energy systems. Longer-term outcomes that this transition will produce, including the enablement of future technologies and solutions to support and sustain new and growing industries, are paramount to meeting net-zero commitments and enabling a sustained lower carbon future.

PARTNERSHIP INTAKE PROGRAM

In addition to ERA's competitive Call for Proposals process, projects are also 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 December 2020, ERA received support through Alberta's TIER fund and the Federal LCELF to recapitalize its Partnership Intake Program. This includes a $50 million commitment from the Government of Alberta's TIER fund and up to $25 million from the LCELF.

The process has been highly effective for accelerating innovation, maximizing impact through leverage of partner funds, coordinating investment priorities, and reducing the administrative burden for project proponents. The Partnership Intake Program presents ERA with an avenue to align its funding and help fill the gaps found in Alberta's and Canada's innovation ecosystem. Further, it is a way for ERA to work collaboratively with other funders in the innovation system by leveraging efforts to advance commercialization and adoption of innovative technologies and solutions.

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:

1. Government of Alberta
2. Alberta Innovates
3. Natural Resources Canada (NRCan)
4. Northern Alberta Institute for Technology (NAIT)
5. University of Calgary
6. University of Alberta
7. Sustainable Development Technology Canada (SDTC)
8. Business Development Bank of Canada (BDC)
9. Export Development Canada (EDC)
10. Ontario Centres of Excellence (OCE)
11. Natural Gas Innovation Fund (NGIF)
12. EVOK Innovations
13. XPRIZE Foundation.

ACTION 3:
Select innovative technologies using a rigorous and transparent process

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 ERA's mandate, rolling three-year business plan, and Technology Roadmap. These directional documents are informed by engagment with government, industry, investors, and innovators.

To effectively select innovative, later-stage technologies, ERA relies upon a three-stage process in its calls for proposals to ensure that funds are invested prudently.

ERA's ESB Program requires a slightly different process, using eligibility criteria. Projects that meet all the program requirements are approved on a first-come, first-served basis and receive a fixed incentive amount for a prescribed list of eligible energy efficiency and renewable energy upgrades. Incentive funding applications go through a two-stage process starting with a pre-approval, at which time funds are reserved for six months (up to 12 months in some cases). A second stage of verification occurs once the project is complete. Only successfully completed projects receive incentive funding.

ACTION 4:
Identify solutions that build on Alberta's strengths and help create new business opportunities.

The 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 ERA's Board of Directors and shares findings before any funding decisions are made.

Face-to-face communication has always played a prominent role in ERA's communication strategy. Bringing people together to have real conversations around decarbonization goals builds clarity and can accelerate action. Although ERA regularly hosts meetings with stakeholders to better understand new business opportunities, the organization's conference and workshop plan involves a series of targeted engagement events to inform business planning and upcoming funding calls. During the COVID-19 pandemic, ERA transitioned conferences and workshops to virtual platforms and, at time of writing, continues to meet with stakeholders online.

In 2021/24, ERA plans to further develop its technology scouting capacity by leveraging its Trusted Partner network, engaging directly with innovators to learn more about their technologies and working closely with industry to understand their needs for clean technology solutions. For example, ERA's broad network of partners provides the opportunity to identify shared challenges, become aware of leveraging opportunities, and engage with innovators. In addition, ERA has purposefully engaged in targeted outreach and hosted workshops that involve a multitude of key 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 create job growth and emissions reductions.

Carbon Upcycling Technologies - CO_2 to Graphene Reactors

STRATEGIC PRIORITY 2

Drive Commercialization

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

OBJECTIVES

1. Increase commercialization and market adoption of emissions-reducing technologies
2. Technological learnings and knowledge-sharing to help accelerate commercial deployment of GHG-reducing technologies
3. 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
4. Increase recognition of Alberta as an innovation and clean technology leader and strong environmental steward.

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.

Kuva Systems - Natural Gas Challenge

KEY MEASURES

- COLLABORATIVE PARTNERSHIPS
- TECHNOLOGY INVESTMENT TRL PROGRESSION
- GDP IMPACT
- JOB CREATION
- PERCENTAGE OF COMPLETED PROJECTS CONTINUING TOWARD COMMERCIALIZATION
- PERCENTAGE OF PROJECTS SUPPORTING SMALL AND MEDIUM-SIZED ENTERPRISES

ACTION 1:
Manage a balanced portfolio

ERA's TRM guides its investment decisions and informs its portfolio mix. ERA regularly reviews and assesses its investment portfolio to ensure that it is reflective of market needs, industry demand for clean technology and the policy outcomes of the current governments. To enable this, in 2021/24 ERA will continue to work closely with provincial and federal governments to monitor policy changes and outcomes that could result in adjustments to the priority investment areas. ERA also regularly engages with industry, other funding organizations, accelerators, associations, and clean technology innovators to gain valuable insight to inform the design of future challenges. With increasing industry and government commitments towards net-zero and significant focus on sector-wide emissions reduction, ERA understands the need to reflect both short- and long-term technology needs, along with demand scenarios, within its priority investment areas. This will ensure investment is directed to reducing emissions in existing processes and to those technologies that will play an important role in the overall energy transition.

ACTION 2:
Deliver programming to increase market adoption of emissions-reducing technologies

In 2021/24, ERA will commit $150 million through its Shovel-Ready Challenge. This funding opportunity will provide vital financial support to companies ready to implement emissions reduction technologies in both greenfield and brownfield operations. To be eligible for this progam, projects must be ready for implementation within 60 days of funding approval. Project implementation will result in operational efficiencies, cost and emissions reductions, new investment, job creation and retention, and address longer-term environmental sustainability priorities. The Government of Alberta is contributing up to $100 million for the Shovel-Ready Challenge through the TIER fund. Up to $50 million in additional funding will also be available from the Government of Canada's LCELF. This support will be leveraged with private funding, leading to projects valued at approximately $500 million.

ERA's new ESB Program—a $55 million funding opportunity to support cost-saving and emissions-reducing projects targeted at small- and medium-scale industrial and commercial facilities—was launched in February 2021. This initiative will accelerate the uptake of commercially available emissions-reducing technologies and allow businesses such as manufacturing facilities, agricultural operations, office buildings and fabrication shops to reduce operating costs and lower emissions by adopting modern building systems, and updating facility operations, enabling smarter energy use and less waste.

Over the next 18 months, the ESB Program will help Alberta businesses grow their operations and become more competitive, while creating skilled jobs and boosting economic recovery. ESB funding is sourced from the carbon price paid by Large Final Emitters (LFEs) in Alberta through the TIER fund, together leveraged with Federal Low Carbon Economy Leadership funds.

The projects are anticipated to account for lifetime GHG reductions of 1.1 million tonnes of CO_2e, create about 1,400 (direct and indirect) jobs and drive an estimated $300 million in economic activity.

As ERA implements the ESB Program in 2021, it will establish key performance indicators, and monitor uptake and industry response to determine the future fit of similar programs within ERA's mandate going forward. Program learnings will help ERA provide recommendations on how future energy efficiency initiatives in the province could be best delivered, and by whom.

ACTION 3:
Build on ERA's role as a convener of resources and facilitate strategic partnerships to address barriers to commercialization

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. In 2021/24 ERA will continue to work with government and industry to help address these gaps and strengthen companies and their efforts to bring new technologies and solutions to market.

ERA has always looked for additional opportunities to support innovators on their path to commercialization. In 2021/24 ERA will continue to focus on establishing Trusted Partnerships with those agencies that fund later stage technology readiness projects, ensuring ERA's suite of partnerships is balanced across the innovation continuum. This model enables ERA to work with early-stage technology innovators to connect them to the right funding and resources based on their technology's maturity. As technologies progress along the innovation continuum, ERA is aware of and positioned to continue to support them. ERA is also working closely with academic institutions and investment entities to enhance their efforts in driving commercialization of technologies.

ERA's current participation in the $50 million international Accelerating CCS Technologies (ACT3) consortium will advance technologies in CO_2 capture, utilization and storage. ERA is seeking technologies with strong potential for commercialization in Alberta. All projects required an international partnership to be considered. Final decisions on projects will be made in June 2021.

INTERNATIONAL PARTNERSHIPS

In 2021 ERA will build a larger network of international partnerships and strengthen relationships that will help raise the profile of ERA's projects and technologies that have the potential to solve issues the world is facing. ERA will continue working with its provincial and federal government partners to identify opportunities through their respective trade and consular offices to develop international networks that will increase the awareness and impact of our communications and funding activities. ERA is also working closely with Invest Alberta, the Province's new crown corporation focused on increasing investment in Alberta.

INNOVATOR SUPPORT PILOT

ERA is uniquely positioned to leverage and convene capacity in the innovation system to foster the commercialization of clean technology solutions. That is why, in May 2020, ERA officially launched its Innovator Support Pilot (ISP). The initiative targeted projects that have gone through ERA's application process and had proposals that showed technological promise but did not qualify for funding due to specific challenges or barriers. ERA onboarded five companies into the program and connected them with service providers, including Alberta Innovates, TEC Edmonton, Platform Calgary, Zone Startups Calgary, and Foresight Cleantech Accelerator, to help strengthen elements critical to business success such as organizational strategy and governance, technology and commercial readiness strategy, financial planning, marketing, and customer attraction.

At time of writing, the first group of companies is progressing through the program, which is set to wrap-up in June 2021. Moving forward, ERA will be assessing the value of the program and its achieved outcomes, as well as assessing the potential to include this as an ongoing program in its suite of offerings.

STAKEHOLDER EVENTS

Although face-to-face meetings and stakeholder events have been largely cancelled or postponed during COVID-19, ERA is finding new ways to deliver important programming and continuing to inspire collaboration and innovation in this province.

Since 2011, ERA has held large conference style events. The impetus and purpose of these events, however, has changed over time and in 2021/24 ERA plans to scale-down its large event focus and instead host a one-day event profiling ERA projects and their outcomes. ERA will continue to host its biannual SPARK Speaker Series and Lessons Learned events for the purpose of knowledge transfer and will also focus on leveraging existing and emerging innovation events that draw its target audience as a means of facilitating strategic partnerships to overcome barriers to commercialization.

Lafarge Canada - Low Carbon Fuels Project

ACTION 4:
Act as a trusted advisor to the Government of Alberta by providing strategic advice on policy 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. Mechanisms, such as Alberta's TIER regulation, can spur the advancement of technologies that help achieve desired environmental outcomes while growing the economy. However, policy and regulatory predictability and certainty are often key considerations for companies developing or investing in clean technology.

ERA plays an important role in understanding the regulatory and policy barriers faced by innovators in Alberta and bringing this insight to government through its work as a trusted advisor and via policy collaboratives. ERA also works with a variety of key stakeholders across the innovation ecosystem to provide advice that helps ensure policy and regulation enables innovation and technology deployment, rather than create barriers.

Alignment with provincial and federal policy outcomes is essential to ERA's success. ERA works closely with all levels of government to help support delivery of their priorities and objectives. We do this by designing our calls in collaboration with governments, and by contributing advice to policy design in areas that align with our mandate. For example, ERA is currently participating in engagement on Alberta's Hydrogen Strategy, and will collaborate directly with the Government of Alberta on the design of future calls that support the strategy's objectives.

Going forward, ERA will continue to engage and collaborate with regulators and policy makers to support the design of each Call for Proposals.

ACTION 5:
Engage with key stakeholders to build on ERA's role as an accelerator of GHG-reducing technologies

As a funder of later stage technologies, ERA is uniquely positioned in the ecosystem to coordinate with other funding agencies and accelerators to drive technology development. Working closely with academic partners and early stage funders like Alberta Innovates, ERA understands calls can be designed to ensure there are no funding gaps as technologies advance along the innovation continuum. For example, ERA's funding serves as a signal to equity position funders of promising technologies which could benefit from later stage funding to support the market deployment and commercialization phases. ERA does this through its role as a convenor in the ecosystem, leveraging its well-established networks and trusted partners, its relationship with governments and other funding organizations, and its engagement activities to drive aligned outcomes.

In 2021/24, ERA will initiate a formal and informal, qualitative and quantitative engagement plan to make certain the organization is meeting the needs of its key stakeholders and to identify recommendations for future enhancements to programming and operational performance.

STRATEGIC PRIORITY 3

Maximize Impact

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

OBJECTIVES

1. Demonstrate ERA's contribution and support to provincial policy priorities, including emission reductions and economic growth
2. Increase awareness of ERA's role within the innovation system
3. Support the Government of Alberta to achieve its strategic communications outcomes and objectives related to the economy and the environment
4. Leverage investments to create larger pools of capital for innovation and technology
5. 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)
6. Increase operational effectiveness and efficiency in ERA's decision-making cycle.

IMPACTS

- Increase awareness in ERA's ability to support Alberta's action on climate change
- ERA's trusted partners and key stakeholders understand the processes, role and impact; benefit through lessons-learned from project execution, and remain ERA's champions
- Demonstrate GHG reduction potential of innovative technologies on a project and market level
- Refine ERA's Performance Management Plan to maximize outreach potential
- 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

ACTION 1:
Share compelling stories about project success

In 2021/24, ERA will continue to deliver a story-based content strategy across all communication platforms. However, ERA will put an increased focus on completed projects, introducing a new "proven" story series that showcases the impact of emissions-reducing technology with the aim of increasing the market uptake of newly commercialized technologies based on their emissions-reducing potential and economic benefits.

ACTION 2:
Enable the Government of Alberta to leverage ERA's successes and lessons learned

It is more important for all Albertans to understand that the Province is working toward decarbonization goals, than it is 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 and economic development. In 2021/24, 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 3:
Maximize and leverage shared investment capacity and expertise

Trusted Partnerships have provided a mechanism for ERA to engage in a consistent and meaningful way across the innovation ecosystem and maximize investments in projects that otherwise would have been outside of the scope of its competitive, focused calls.

Moving forward, ERA will refine its Trusted Partner model to better define the roles of partners to create more strategic alliances to deliver on ERA's mandate and to ensure continued coordination across the innovation ecosystem. ERA will also increase the frequency of engagement with its formal partners and those who play a key role in enabling the innovation ecosystem, including but not limited to accelerators, industry and innovation networks, and industry alliances. The intent is to gain a greater understanding of the emerging technology pipeline to inform ERA's call design and TRM, and to enhance deal flow to quickly leverage investments through ERA's Partnership Intake Program.

These engagements will also serve to further enable collaboration, coordination, knowledge sharing and capacity building across the innovation ecosystem. ERA also plans to invest more time in relationships with academic partners and their innovation hubs to support knowledge transfer that will accelerate the development of emissions-reducing technologies.

ACTION 4:
Strengthen performance management approach

Performance management is critical to demonstrating that ERA is delivering on its mandate while staying true to its core values.

ERA is a well-established delivery agent of Alberta's climate change and economic policy, and its efforts are aligned with defined provincial, national, and international metrics. ERA's performance management approach allows the organization to measure how it is performing against its deliverables.

Strategic Dashboard

To demonstrate and communicate how ERA is delivering results, the organization is committed to establishing and reporting on portfolio-based performance outcomes and measures. ERA's internal Strategic Dashboard gives a bird's eye view of how the portfolio of projects is performing against original projections forecast at time of project approvals. Current projections are updated each quarter as projects are onboarded either via ERA's Challenges or the Partnership Intake Program. Recent additions to the Strategic Dashboard include key performance metrics for ERA's initiatives, including the ESB Program. ERA will continue reporting on the ESB Program progress and track key indicators that will help evaluate program success upon completion. ERA is also continuing to track project attrition and the reasons why certain projects get cancelled or terminate early. ERA is looking to further analyze these attrition metrics to understand if there are barriers, specific to certain types of projects or sectors, that can be addressed by the broader innovation ecosystem.

Using a third party contractor, key indicators, which include the economy, environment, technology, and community, contain metrics that allow ERA to understand how investments are making a difference. ERA is continually updating these metrics along with fine-tuning the collection methodology behind them to align with best practices.

Measuring GHG Reductions

Applicants for ERA funding are adjudicated on the GHG reduction potential of their projects. ERA also annually quantifies and reports on the emission reductions that will be delivered by its funded projects.

Using a third party contractor, ERA calculates two different, but related, emissions reductions projections for projects in its investment portfolio:

1. The first is the total GHG emissions reductions anticipated from each project directly. This value is provided by project proponents and reviewed by ERA to ensure the basis and methodology for the estimate is sound. ERA has estimated its 2020 project-level reductions to be 7.6Mt. ERA will quantify these emissions in 2021. ERA's next benchmark is 2030 project-level reductions which are currently estimated at 37.7Mt. While ERA strives to reach its targets, projected emissions reductions are typically higher than actual reductions due to project

attrition. ERA has seen just above 20 per cent attrition across its portfolio of projects.

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. This includes GHG emissions intensity, the estimated market size, various economic indicators, and the lifespan of the technology. Given the markets constantly fluctuate with new regulations and new technologies that were once innovative becoming commercial, ERA is constantly reevaluating these estimates to ensure they reflect the most current market conditions. This estimate is dynamic and follows the changing trajectory of the technologies, industries and markets it represents.

In 2020, ERA undertook analysis to quantify the net economic impact resulting from ERA's emissions reduction investments. At point of analysis, ERA's funded projects were estimated to result in cumulative net GHG emissions reductions of 36Mt CO_2e by 2030 and 72 Mt CO_2e by 2050. The avoided climate damages associated with these reductions are valued at $1.3 billion by 2030 and $2.4 billion by 2050.

Factoring in ERA's investment of $566 million at point of analysis, this results in net benefits of $853.9 million by 2030 and nearly $2 billion by 2050, amounting to a return of $3.10 for every dollar ERA invests in 2030*. From this data, ERA is able to communicate the value attributed to the project technologies should they be adopted into market. This data may also be used to signal to investors the importance and economic benefit these technologies and solutions have in reaching net-zero climate goals. ERA will continue with the valuation of its emissions reductions, determining and explaining trends that ensue in the next three years, and working with the innovation ecosystem to advance key technologies to ready them for adoption into market.

Performance Management Refinement

Ensuring responsible and effective stewardship of public funds requires ERA to track and report metrics on past performance. As data analysis and reporting becomes more advanced, additional initiatives are being evaluated. ERA is seeking to further demonstrate to its stakeholders a line of sight between its funding, technology commercialization activities, and market GHG emissions reductions, including:

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

* ERA calculates the return on investment using using Environment and Climate Change Canada's Social Cost of Carbon valuation model. At the time of analysis, ERA projects were expected to reduce emissions by 35.8 Mt CO_2e by 2030, which is equivalent to avoiding social, environmental, health, and financial damages valued at $1.26 billion. When factoring in the cost of ERA's investments into the projects, this results in net benefits estimated at $853.9 million by 2030, equivalent to an investment return of $3.1 for each dollar invested. Note that both benefits and investment (i.e., cost) were estimated at present-value terms by applying a 3% discount rate.

As ERA continues to refine its methodology for current metric collection, it is also looking at augmenting its suite of metrics. This includes adding new metrics such as those aligned with the ESB Program, developing a narrative and storyboard for project success stories, including those from the Innovator Support Pilot Program, and adding to and refining its North American Industry Classification System codes to ensure ERA is prepared for the annual Economic Impact Analysis. ERA is also going to assess its stakeholder community-level metrics (e.g., website traffic, satisfaction surveys, etc.) to understand how to best utilize available communications channels to ensure ERA is reaching the right audiences and is maximizing its outreach.

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 measure of success. ERA is committed to continuous improvement and operational excellence. ERA recognizes the importance of developing the inclusive culture needed to develop programs and achieve outcomes that are relevant and accessible to Alberta's diverse populations. With that in mind, ERA is developing an Equity, Diversity and Inclusion (EDI)* strategy that will support the collection of data to identify potential opportunities to incorporate EDI initiatives into its operations. ERA will be creating an internal baseline to understand if there are operational barriers to implementing the EDI strategy. ERA will begin collecting some initial EDI information from its proposal applicants, starting with ERA's Shovel-Ready Challenge, in order to gauge willingness to participate in further EDI studies and to help create a baseline for data collection.

Ongoing Operational Improvements

ERA's commitment to deliver its operations effectively and efficiently has always been a guiding principle of the organization. With an increase in overlapping call and program deliverables over the next 18 months, ERA has had to bolster its operational capacity. In 2020, ERA successfully transitioned programming and staff from Energy Efficiency Alberta and established a Calgary-based office to reflect the provincial reach of the organization. Post-COVID-19, the presence of staff in Calgary will ensure effective and timely engagement with industry and other stakeholders, in addition to the established capacity that exists in Edmonton.

ERA's approach to resourcing and capacity building is centered on being able to scale in response to the needs of the organization, government and the innovation ecosystem. To enable this, ERA employs a suite of contract employees and service providers. Going into 2021, ERA has requested all service providers identify efficiencies and cost reductions where possible to assist ERA in achieving reductions to its overall operating costs. The focus is on working more efficiently given there is an increase in organizational activity in this business planning cycle.

*EDI are terms describing the need to remove systemic barriers and biases to ensure all individuals have equal opportunity to access and benefit programs, recognizing differences in race, colour, place of origin, religion, sexual orientation etc., and ensuring all individuals are valued and respected for their contributions equally.

4.0 OPERATING BUDGET

ERA has prepared a budget to outline current estimates of potential funding. However, it should be noted that ERA can scale its calls for proposals and Partnership Intake Program to fit within any funding envelope that is confirmed by the Government of Alberta or other funding partners.

In addition, ERA has the flexibility to reallocate funds to future funding opportunities from approved projects that may not proceed.

Given the current challenging economic environment, ongoing pandemic and long-term impact on the Alberta economy, ERA actively seeks opportunities to increase cost effectiveness and efficiency to align with its key stakeholder, the Government of Alberta. The operating budget represents an effort by ERA management and service providers to keep the overall administrative cost burden low relative to the funds under administration.

ERA launched the ESB Program in early 2021, and the increase in total operating budget is reflective of the additional administrative costs related to delivering this program over the next 12 to 18 months. Administration costs are forecast to be approximately $7 million for the program or 13% of the total program allocation, which is lower than historical industry average (typically 20% or greater). Benefits specific to this type of program include high volumes of participation, easy program accessibility for small and medium sized businesses, increased capacity building, broad market research on the supported measures, creating a robust network of contractors, and as such, total administrative costs are higher than typical ERA funding calls.

ERA's estimated operating budget for fiscal 2021/22 is consistent with the forecast actual expenses for fiscal 2020/21 when the ESB Program is removed. This is reflective of the high volume of applications through ERA's calls for proposal and the resulting increase in total active projects under management for the organization. As a percentage of total funds under management, ERA continues to be highly efficient and the estimated operating cost metric is forecast to be just over 1 per cent for fiscal 2020/21, and budgeted to be less than 2 per cent for fiscal 2021/22.

Emissions Reduction Alberta (ERA)

	2020/21 Budget $	2020/21 Forecast $	2021/22 Budget $	2022/23 Budget $	2023/24 Budget $	
Revenue						
Grant revenue	50,000,000	180,000,000	115,000,000	76,800,000	50,000,000	(a)
Interest income	3,993,806	4,776,745	3,238,632	2,332,440	1,494,196	(b)
Other Revenue	-	230,000	230,000	-	-	
Total Revenue	**53,993,806**	**185,006,745**	**118,468,632**	**79,132,440**	**51,494,196**	
Project Expenditures	128,754,105	92,234,287	256,264,384	169,904,337	133,081,025	(c)
Revenue less Project Expenditures	(74,760,299)	92,772,458	(137,795,751)	(90,771,897)	(81,586,829)	
Operating Expenses						
General & Administrative Expenses						
Corporate costs	266,315	217,470	344,394	351,281	358,307	
Insurance	11,472	19,066	24,272	24,757	25,252	
GST expense	114,108	184,057	242,951	247,810	252,766	
Total General & Admin Expenses	391,895	420,593	611,616	623,848	636,325	(d)
Management Expenses						
Project Adjudication and Portfolio Management	1,879,726	2,628,506	2,115,045	2,088,876	1,973,027	
Contracts	247,680	323,108	457,376	354,417	283,511	
Communication	1,017,635	1,235,476	1,130,581	1,219,221	1,200,735	
Strategic	261,504	426,263	448,355	524,502	370,296	
Corporate Administration	688,383	716,013	762,096	762,851	917,009	
Governance	170,184	193,973	183,131	193,282	219,495	
ESB	-	2,023,210	3,725,532	757,931	-	
Total Management Expenses	4,265,112	7,546,549	8,822,115	5,901,079	4,964,073	(e)
Other Contracted Services and Special Initiatives						
Consulting contracted services	381,598	474,521	762,035	765,000	765,000	(f)
Spark Conference Costs	75,000	-	100,000	-	223,000	(g)
Total Other Contracted Services and Special Initiatives	456,598	474,521	862,035	765,000	988,000	
Board and Oversight						
Board remuneration and expense	151,731	58,039	125,000	127,500	130,050	(h)
Professional fees	51,198	49,500	49,500	50,490	51,500	
Total Board and Oversight	202,929	107,539	174,500	177,990	181,550	
Total Operating Expense	5,316,534	8,549,202	10,470,266	7,467,917	6,769,948	
Surplus / (Deficiency) of Funds for the year	(80,076,833)	84,223,256	(148,266,017)	(98,239,815)	(88,356,777)	
Total Funds Under Management - beginning of year	**374,854,378**	**374,854,378**	**459,077,634**	**318,811,617**	**220,571,802**	(i)
Total Funds Under Management - end of year	**294,777,545**	**459,077,634**	**318,811,617**	**220,571,802**	**132,215,025**	
Committed Funds for Approved Projects	**682,039,047**	**928,224,327**	**971,224,327**	**1,016,224,327**	**1,061,224,327**	(j)
Total Project Funds paid to date	**(397,780,886)**	**(363,092,317)**	**(619,356,700)**	**(789,261,037)**	**(922,342,063)**	
Remaining Funds required to fulfill approved project commitments	**284,258,161**	**565,132,010**	**351,867,627**	**226,963,290**	**138,882,264**	
Uncommitted Funds	**10,519,384**	**(106,054,376)**	**(33,056,010)**	**(6,391,487)**	**(6,667,239)**	
Operating costs as a % of Funds Required to Fulfill Approved Project Commitments (With ESB)	**N/A**	**1.5%**	**3.0%**	**3.3%**	**4.9%**	(k)
Operating costs as a % of Funds Required to Fulfill Approved Project Commitments (Without ESB)	**1.9%**	**1.2%**	**1.9%**	**3.0%**	**N/A**	

Notes and assumptions

(a) As announced on November 2, 2020, ERA will receive $180 million of TIER funding for stimulus programs that were proposed by ERA as part of a wider TIER Economic Stimulus response by the Government of Alberta. The GOA has confirmed that ERA will receive $100 million to fund its Shovel Ready Challenge, $50 million for its Partnership Intake Program, and $30 million for the Energy Savings for Business (ESB) Program. This funding is to be augmented by up to $91.8 million of additional federal funding from the Low Carbon Economy Leadership Fund (LCELF) which has been approved for ERA's programs. The cash flow of these funds will follow the reimbursement to the ultimate recipients, therefore the flow of funds has been forecast to be received as $65 million in FY22 and $26.8 million in FY23. ERA has also included a placeholder of $50 million for future grant allocations from the GOA. 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 forecasted by ERA's investment advisors at CIBC. The interest consists of the operating account (0.65%), business investment account (0.95% for top tier), $50 million GIC (1.20%) and another $300 million Flexi GIC (1.25%). No increases have been forecasted for this budget cycle given current market expectations.

(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 in FY22 to accommodate the new Calgary location and expanded Edmonton office for new staff brought on in FY21.

(e) Total Management expense costs have been budgeted to increase from the current year forecast as a result of the ESB program which will open for applications on February 1, 2021 and run for 18 months. Cost will decrease in FY23 and FY24 accordingly as this program completes.

(f) Other Consultant costs are estimated to be increased from the current year forecast to accommodate projects anticipated in fiscal 2022 including consulting support for project proponents to enhance project viability. This also includes Alberta's support for the Transition Accelerator.

(g) Spark Conference will be held Fall 2021 but will be largely scaled back and the format altered to suit the conference market at that time.

(h) Board remuneration and expense budget will remain similar to FY20 as FY21 had an abnormally low amount of travel due to the worldwide COVID pandemic.

(i) Based on Cash flow projections for the month ended December 31, 2020. Represents ERA's total funds under management.

(j) Based on actual funding approved for remaining active projects in all completed calls and assumptions for Partnership Intake. Future approved rounds are based on estimates. Funds are shown as committed once the EOI cycle has started for a particular Call.

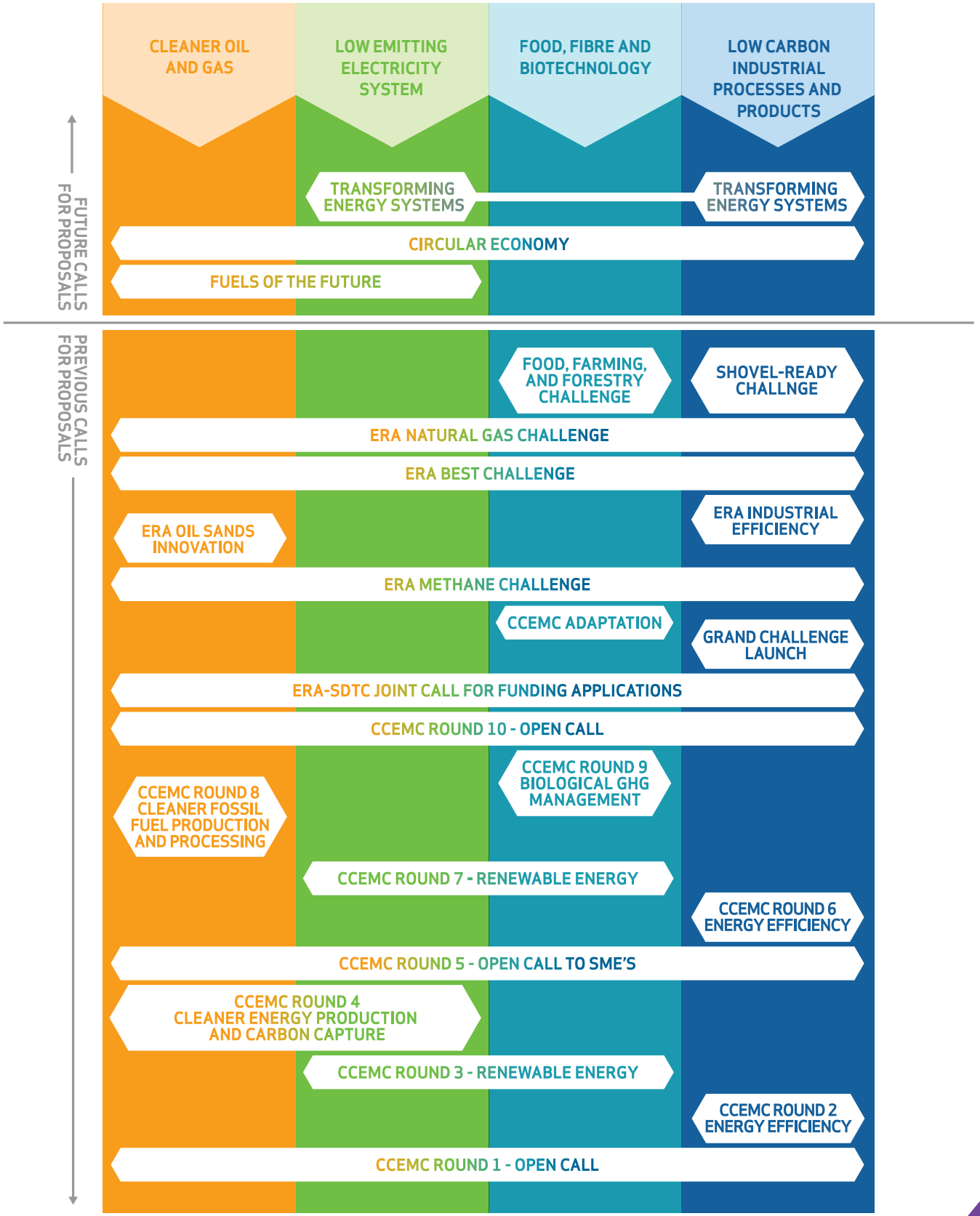
	$
Total commitments for remaining approved projects on completed Calls	**615,224,327**
ESB 2020/21	48,000,000
Call 6 - Food, Farming and Forestry	40,000,000
Call 7 - Shovel Ready	150,000,000
Partnership Intake FY22	75,000,000
Committed Funds for approved projects - Forecast FY21	**928,224,327**

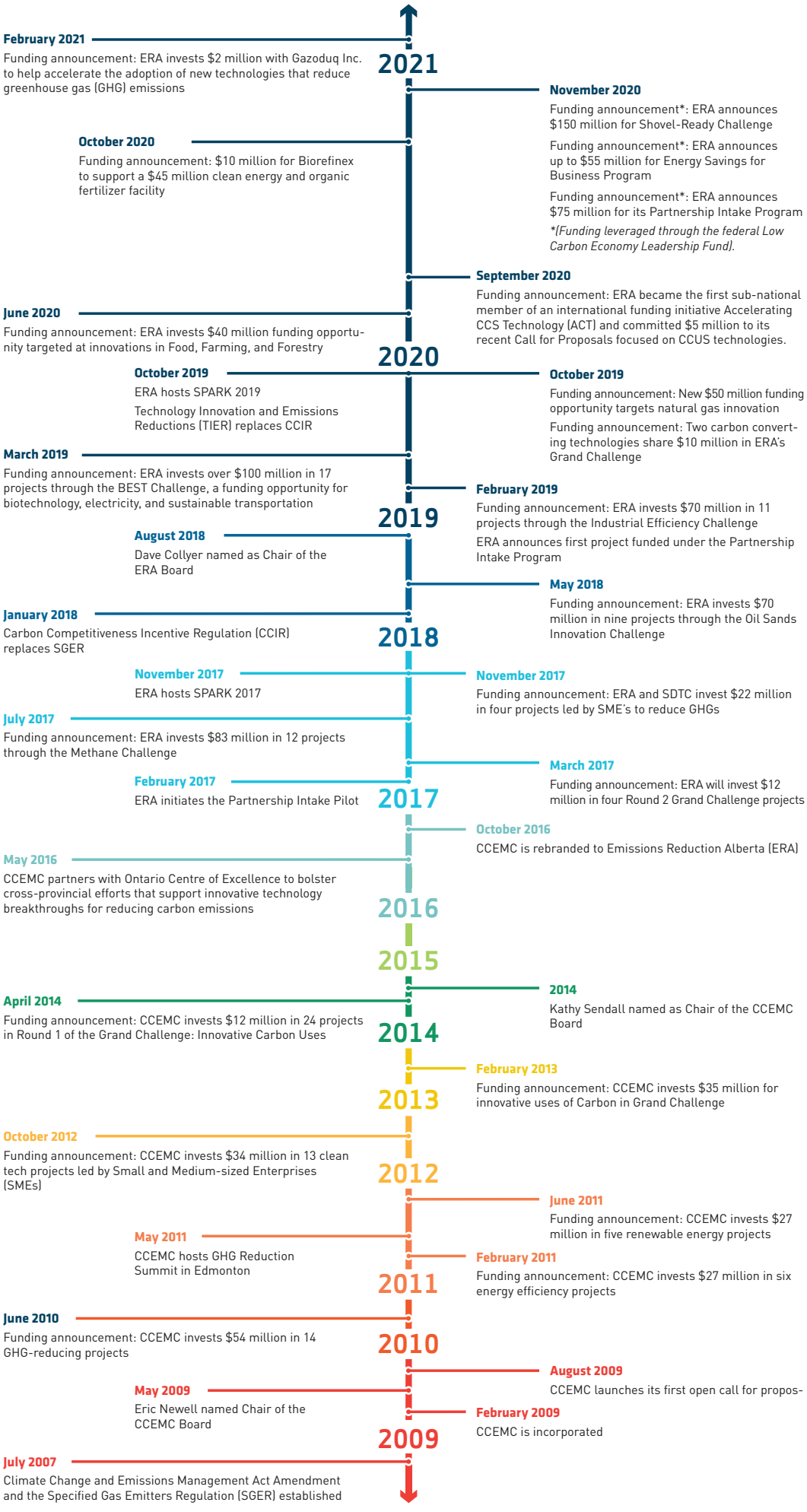
Forecast Future Rounds	**$**
Call 8 and 2021/22 Partnership Intake	43,000,000
Call 9, ACT 4 and 2022/23 Partnership Intake	45,000,000
Call 10 and 2023/24 Partnership Intake	45,000,000

(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. When ESB is removed, the operating metric improves given the ESB program experiences a higher administrative cost burden than ERA's typical portfolio of projects.

APPENDIX

CALL ALIGNMENT WITH FOCUS AREAS




2021
February 2021
Funding announcement: ERA invests $2 million with Gazoduq Inc. to help accelerate the adoption of new technologies that reduce greenhouse gas (GHG) emissions
November 2020
Funding announcement*: ERA announces $150 million for Shovel-Ready Challenge
Funding announcement*: ERA announces up to $55 million for Energy Savings for Business Program
Funding announcement*: ERA announces $75 million for its Partnership Intake Program
*(Funding leveraged through the federal Low Carbon Economy Leadership Fund).
October 2020
Funding announcement: $10 million for Biorefinex to support a $45 million clean energy and organic fertilizer facility
2020
September 2020
Funding announcement: ERA became the first sub-national member of an international funding initiative Accelerating CCS Technology (ACT) and committed $5 million to its recent Call for Proposals focused on CCUS technologies.
June 2020
Funding announcement: ERA invests $40 million funding opportunity targeted at innovations in Food, Farming, and Forestry
October 2019
ERA hosts SPARK 2019
Technology Innovation and Emissions Reductions (TIER) replaces CCIR
October 2019
Funding announcement: New $50 million funding opportunity targets natural gas innovation
Funding announcement: Two carbon converting technologies share $10 million in ERA's Grand Challenge
March 2019
Funding announcement: ERA invests over $100 million in 17 projects through the BEST Challenge, a funding opportunity for biotechnology, electricity, and sustainable transportation
2019
February 2019
Funding announcement: ERA invests $70 million in 11 projects through the Industrial Efficiency Challenge
ERA announces first project funded under the Partnership Intake Program
August 2018
Dave Collyer named as Chair of the ERA Board
May 2018
Funding announcement: ERA invests $70 million in nine projects through the Oil Sands Innovation Challenge
January 2018
Carbon Competitiveness Incentive Regulation (CCIR) replaces SGER
2018
November 2017
ERA hosts SPARK 2017
November 2017
Funding announcement: ERA and SDTC invest $22 million in four projects led by SME's to reduce GHGs
July 2017
Funding announcement: ERA invests $83 million in 12 projects through the Methane Challenge
March 2017
Funding announcement: ERA will invest $12 million in four Round 2 Grand Challenge projects
February 2017
ERA initiates the Partnership Intake Pilot
2017
October 2016
CCEMC is rebranded to Emissions Reduction Alberta (ERA)
May 2016
CCEMC partners with Ontario Centre of Excellence to bolster cross-provincial efforts that support innovative technology breakthroughs for reducing carbon emissions
2016
2015
2014
Kathy Sendall named as Chair of the CCEMC Board
April 2014
Funding announcement: CCEMC invests $12 million in 24 projects in Round 1 of the Grand Challenge: Innovative Carbon Uses
2014
February 2013
Funding announcement: CCEMC invests $35 million for innovative uses of Carbon in Grand Challenge
2013
October 2012
Funding announcement: CCEMC invests $34 million in 13 clean tech projects led by Small and Medium-sized Enterprises (SMEs)
2012
June 2011
Funding announcement: CCEMC invests $27 million in five renewable energy projects
May 2011
CCEMC hosts GHG Reduction Summit in Edmonton
February 2011
Funding announcement: CCEMC invests $27 million in six energy efficiency projects
2011
June 2010
Funding announcement: CCEMC invests $54 million in 14 GHG-reducing projects
2010
August 2009
CCEMC launches its first open call for propos-
May 2009
Eric Newell named Chair of the CCEMC Board
February 2009
CCEMC is incorporated
2009
July 2007
Climate Change and Emissions Management Act Amendment and the Specified Gas Emitters Regulation (SGER) established