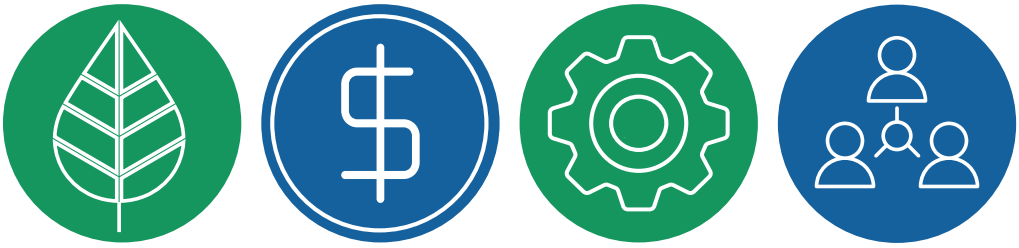
EMISSIONS REDUCTION ALBERTA

Investing in technologies for a lower carbon future.



2018-2021 BUSINESS PLAN

April, 2018

WE ARE EMISSIONS REDUCTION ALBERTA

WE ARE INNOVATORS, BUILDERS AND GROUND BREAKERS. WE ARE ALSO CONVENERS.

We invest in promising technologies that reduce greenhouse gas (GHG) emissions. And we propel those technologies along the path of innovation by bringing together the right regulatory, policy, business innovation tools and people. Our plans are big and our vision is ambitious.

As innovators, we imagine a better future. A sustainable, lower carbon future. One we can create together.

Imagine a future where industry, innovators and government are aligned on common outcomes, and committed to achieving the highest standard of economic and environmental sustainability.

Imagine a future where scientists, researchers, entrepreneurs and technology developers get the support and investment they need to develop and commercialize game-changing technologies.And where those technologies pave the way for new companies and new industries.

Imagine a future where all emissions are captured and used to create and strengthen everyday products—from chemicals and fertilizers to cement and hockey sticks.

Imagine a future where new technologies lead to new jobs—where thousands of Albertans go to work creating cleaner, more sustainable energy sources or turning waste into innovative products and lower carbon fuels.

And where those cleaner, more sustainable sources of energy power our homes, businesses, industries and communities. And those new products reduce our own environmental footprint.

Imagine a future where those who share and support our vision know they are helping to create a better province for future generations.

Imagine a future we can build together where Alberta's reputation is synonymous with economic growth, community health and environmental leadership on a local, national and global scale.

This future is possible. It will take work. We know it will be worth it.

ERA has proven that this progress is possible. And we continue to take action.

In the future, we should never have to ask ourselves if we have done enough. We can produce oil with lower emissions. We can create power from landfill waste. We can use CO_2 to strengthen cement—and as a key ingredient in products we haven't even imagined.

We can eliminate methane emissions. And we can create a stronger innovation ecosystem that generates new industries and jobs in Alberta.

We have the people, the resources and the drive to do all of this and show the world that Alberta can be a leader in the lower carbon future.

MESSAGE FROM THE CHAIR

The world is calling for action in response to the global climate challenge, and Alberta is responding.

At ERA, we are putting Alberta's carbon levy to work to accelerate the demonstration and deployment of promising GHG reducing technologies and game-changing innovation.

Our mandate allows us to directly respond to our province's climate leadership and innovation system priorities. The Government of Alberta has committed new funding to ERA to support the delivery of our three-year business plan. This includes $80 million in core funding announced in December 2017, and a further $92.5 million for additional initiatives that fit within the focus of ERA's Technology Roadmap, in areas such as industrial efficiency, community generation, and methane reductions. We will leverage this funding with dollars matched by industry, innovators and other trusted partners across Canada's innovation ecosystem.

Each year, through our strategic planning process, we review our priorities. This focus on continuous improvement led us to identify three 2018–2021 priorities:

1. Accelerate Technology

2. Drive Commercialization

3. Maximize Impact

At ERA, we believe that communicating with our stakeholders, building strategic partnerships and openly sharing our performance metrics leads to stronger outcomes. In 2018-2021, we will put a greater focus on communications and collaboration. We will more clearly articulate the importance of reducing GHG emissions and ERA's role in addressing this challenge as a means to deliver environmental and economic benefits. We will host public sessions to share the lessons learned from projects with the goal of accelerating technology innovation and we will share our success stories in ways that will inspire others to bring their best ideas forward for the benefit of Albertans.

ERA has earned a solid reputation for advancing innovative technologies that will help the Province achieve its climate leadership goals. However, we recognize today's innovators can face significant challenges in moving their solutions from scale-up to market adoption. To deliver on ERA's priorities, we will continue to convene all the players who will provide complete solutions, and offer a unique perspective to inform the policy and regulatory frameworks that will lead to a lower carbon future.

Sincerely,

Kathy Sendall, C.M., LL.D.
Chair, Emissions Reduction Alberta

MESSAGE FROM THE CEO

Nine years ago, our organization was established to help deliver on the Province's climate leadership priorities. Our commitment to these goals has never been stronger.

In 2017, we completed stakeholder research that provided valuable direction for our strategic planning process. You will see this input reflected throughout our 2018-2021 Business Plan, which has refined strategic priorities, and a renewed focus on ensuring the findings and learnings resulting from all projects we fund are shared.

Technology scouting activities and workshops to gather deeper insights into the design of our funding calls will remain core to our business model as we work to support innovators on the path to commercialization. We also intend to tap new networks that may be able to provide even greater leverage opportunities for the technology projects we are helping to advance.

In 2018, we introduced a new Industrial Efficiency Challenge and we will share the stories behind the new projects that will launch as a result of our Oil Sands Innovation Challenge. Both calls will reduce GHG emissions and importantly, operating costs across sectors.

Only by working with trusted partners across the Canadian innovation ecosystem can we take a true systems approach to reducing GHG emissions and securing Alberta's success in a lower carbon economy. Our team at ERA is dedicated to this goal, and the pathway to achieve it is laid out within the pages of this plan.

Sincerely,

Steve MacDonald
CEO, Emissions Reduction Alberta

ERA CORPORATE OVERVIEW

MANDATE

To identify and accelerate innovative solutions that secure Alberta's success in a lower carbon economy.

VISION

Alberta is recognized as an innovation and technology leader in a lower carbon world.

STRATEGIC PRIORITIES

1 ACCELERATE TECHNOLOGY

Seek out and fund the demonstration and deployment of impactful technology solutions.

2 DRIVE COMMERCIALIZATION

Convene the "complete solutions" needed to turn ideas into products and products into companies.

3 MAXIMIZE IMPACT

Invest public funds wisely and responsibly, through investment leverage and excellence in operations.

STRATEGIC PLATFORMS

Communications **Partnerships** **Measurement**

CORE VALUES

Leadership **Innovation** **Collaboration** **Transparency** **Integrity**

KEY PERFORMANCE METRICS

Environment:
GHG emissions reductions

Economy:
Direct investment into Alberta, GDP impact, job creation, new companies/revenues

Technology:
Project technology readiness level (TRL)[1] progression, technologies to market

Community:
Stakeholder awareness and collaborative partnerships

[1] Technology Readiness Levels (TRL) are a type of measurement system used to assess the maturity level of a particular technology. TRL ratings are assigned based on the project's readiness. TRL 1 (scientific discovery) is the lowest and TRL 9 (commercial implementation and technology adoption) is the highest.

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1.0 EXECUTIVE SUMMARY

The world is calling for action in response to the global climate challenge, and Alberta is responding. At Emissions Reduction Alberta (ERA)[2], we recognize that technology is a critical part of the solution to meeting our climate and economic goals. By putting Alberta's carbon price to work to support the demonstration and deployment of promising technologies and game-changing innovation, we are taking an important step to reduce GHG emissions and secure Alberta's success in a lower carbon economy.

CLIMATE AND INNOVATION POLICY FRAMEWORKS

ERA is a key partner in implementing Alberta's Climate Leadership Plan. Our actions are guided by the Province's Climate Change Innovation and Technology Framework (CCITF), and the targets and principles of the Alberta Research and Innovation Framework (ARIF).

Our funding, which comes from compliance payments made under the Government of Alberta's (GoA) Carbon Competitiveness Incentive Regulation (CCIR), is helping to shape a province with a diverse economy, a healthy environment, and a robust innovation ecosystem. To deliver on our three-year business plan, the GoA has committed to provide ERA with $80 million in core funding and a further $92.5 million for additional initiatives that fit within the focus of ERA's Technology Roadmap, in areas such as industrial efficiency, community generation and methane reductions.

OUR PORTFOLIO

ERA's portfolio of investments includes projects that align with Alberta's climate leadership and innovation system priorities, including:

- Reducing carbon dioxide and methane emissions to enable cleaner oil and gas development
- Phasing out coal-fired electricity generation, increasing deployment of renewable energy and supporting a low carbon electricity system
- Promoting sustainable waste management and optimizing use of biological resources
- Improving efficiency at industrial facilities.

ERA QUICK FACTS:

(AS OF MARCH 16, 2018)

Total projects:
129

Total funds committed:
$385 million

Total project value:
>$2.5 billion

Cumulative GHG reductions by 2020:
9 Mt

Cumulative GHG reductions by 2030:
28 Mt

GDP impact in Alberta by 2021:
$1.8 billion

Job creation in Alberta by 2021:
15,500 person-year[3] jobs

= x 300K or x 507

Each year, between now and 2030, ERA estimates its investments will result in emissions reductions of an average of two megatonnes per year. This is equivalent to eliminating emissions associated with electricity use from approximately 300,000 homes per year, or bringing 507 wind turbines on line.

[2]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.

[3]A person-year is equal to one-year of employment for one individual.

THREE STRATEGIC PRIORITIES

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

- Accelerate Technology
- Drive Commercialization
- Maximize Impact

Core to our business is accelerating technology by investing in innovative GHG-reducing solutions. These investments are guided by our Technology Roadmap—a living document that defines technology pathways and areas of focus for ERA's funding. The Roadmap helps us identify solutions that industry needs to address the problems Alberta must solve today, while also seeking out transformative technologies to address Alberta's largest sources of GHG emissions over the longer-term.

At ERA, we know that funding alone will not advance new technologies to commercialization, or result in the low carbon economy we envision for Alberta. Today's innovators face significant and numerous challenges that hinder technologies from scale-up and marketplace adoption. Success requires a complete solutions approach that helps foster the suite of policy, regulatory, program and business innovation tools required to address system challenges and deploy new technologies.

ERA is funded by the GoA, and is committed to investing these funds wisely and responsibly. ERA will maximize the value of these funds by leveraging investment through our partnerships with the Federal Government and other organizations focused on climate innovation. We will also maximize the impact of funding by attaining excellence in operations.

We will leverage three strategic platforms—communications, collaborative partnerships and performance metrics—to showcase the power of the innovation ecosystem as we share and spread our successes and learnings to maximize our impact.

THE PATH FORWARD

Alberta has articulated its desired climate change and innovation outcomes and priorities through the Climate Leadership Plan and the CCITF. This 2018-2021 Business Plan sets out the actions ERA will take to deliver on our mandate, in alignment with this policy direction. Our three strategic priorities, summarized in this executive summary and described in the sections that follow, provide the framework for our actions.

Critical among these actions is the delivery of targeted funding opportunities each year, guided by our Technology Roadmap. Calls for proposals will be augmented by our Partnership Intake pilot—an opportunity for ERA to fund innovative GHG-reducing projects that are brought forward by our trusted funding partners. This process allows us to consider funding promising technologies outside of our traditional call for proposal process, while leveraging the due diligence processes of partners such as Alberta Innovates, Natural Resources Canada (NRCan), and Sustainable Development Technology Canada (SDTC).

In the pages that follow you will learn in greater detail how ERA intends to deliver on Alberta's climate change goals. First, you will see a summary of our Strategic Priorities—this section provides an at-a-glance view of the actions we will take and how we will measure success. In Section 2.0, About our Organization, you will discover how ERA fits into Alberta's climate and innovation system, and gain a better understanding of our complete solutions approach to accelerating technology scale-up and adoption by industry. Section 3.0 further describes how we will deliver on our strategic priorities. And finally, Section 4.0, Strategic Platforms, outlines how we will leverage communications, collaborative partnerships, and performance measurement to harness the power of the innovation ecosystem in support of reducing GHG emissions.

STRATEGIC PRIORITY 1:
ACCELERATE TECHNOLOGY

WHAT WE PLAN TO DO

Invest in projects that align with ERA's Technology Roadmap and market needs, and support GoA priorities, including the Climate Leadership Plan, CCITF and ARIF.

- Fund technologies that reflect ERA's four investment priority areas of focus.

Select innovative technology for funding through a rigorous process using transparent criteria that reduce GHG emissions and represent best-value for investment.

- Fund innovative technology solutions through funding calls and within the Partnership Intake process.

Identify the right projects for funding through increased technology scouting.

- Actively seek out projects through workshops, matchmaking events and our Partnership Intake process.

Engage with stakeholders and participate in events that help ERA identify and accelerate GHG-reducing solutions.

- Host and participate in conferences and workshops that share insight into technology innovation and celebrate solutions to reduce GHGs in Alberta.

WHAT WE SEEK TO ACCOMPLISH

Accelerate the demonstration and deployment of clean technologies that are demanded by the marketplace, and align with Alberta's Climate Leadership Plan and the CCITF.

- Decreased GHG emissions in Alberta and Canada due to projects funded by ERA.

Increase short and long-term jobs in Alberta's clean technology sectors.

- Measurable jobs (temporary and permanent), GDP creation in new sectors, and economic benefits (direct and indirect) created in Alberta from projects co-funded by ERA.

WHERE WE PLAN TO HAVE AN IMPACT

Reduced GHG emissions through innovation and clean technology.

- Accelerate bold solutions that reduce GHG emissions in Alberta, Canada and internationally.

Stronger support for Alberta's economic competitiveness.

- Alberta achieves greater economic growth and diversification through industries supported by the innovation system
- Enhance global reputation for Alberta and Canada as an effective steward of the environment.

Increased skills and employment in clean technology sectors.

- Increased attraction of investment to Alberta.

WHAT WE PLAN TO MEASURE

- GHG emissions reductions
- Clean technology investment
- TRL progression

STRATEGIC PRIORITY 2:
DRIVE COMMERCIALIZATION

WHAT WE PLAN TO DO

Help broker opportunities for policies and regulation to stimulate adoption of clean technology solutions.

- Engage in targeted outreach, collaboration and communications to help educate key stakeholders and to inform policy development
- Manage a portfolio that reflects both "policy push" from government and "market pull" from industry.

Act as a convener of resources that helps address specific barriers to commercialization.

- Identify and triage barriers and challenges to success for high potential ERA applicants
- Facilitate strategic partnerships among projects and resource/knowledge suppliers that lead to cross pollination of ideas and the building of shared resources (e.g., provincial and federal entities, research and polytechnic institutions, financial institutions and private funders).

Monitor, evaluate and share learnings from funded projects.

- Active monitoring and stewardship of current and future funded technology projects
- Celebrate and communicate our expertise, successes and learnings through all ERA communication channels, including annual and quarterly reporting, media outreach and events.

WHAT WE SEEK TO ACCOMPLISH

Increase commercialization and market adoption of ERA technologies and long-term viability of GHG emission reduction technologies.

- Investment in solutions that have a clear market demand results in increased technology commercialization and GHG reductions.

Technological learnings and knowledge sharing to help accelerate commercial deployment of GHG-reducing technologies.

- ERA is viewed by government and other stakeholders as an effective partner for accelerating solutions to reduce GHG emissions through the innovation system.

Increase recognition of Alberta as an innovation and clean technology leader.

- Increased global reputation regarding Alberta's environmental stewardship efforts and results.

WHERE WE PLAN TO HAVE AN IMPACT

Accelerated commercialization and adoption of clean technology.

- Successful and profitable companies commercialize solutions demanded by the market place.

Increased support and engagement of Albertans.

- Recognition of ERA as a key contributor to Alberta's innovation and technology leadership in a lower carbon world.

WHAT WE PLAN TO MEASURE

- Collaborative partnerships
- Commercial viability of clean technology investments
- GDP impact
- Job creation

STRATEGIC PRIORITY 3: MAXIMIZE IMPACT

WHAT WE PLAN TO DO

Maintain existing and establish new partnerships that maximize and leverage shared investment capacity and expertise (e.g., federal and provincial governments, municipalities, large emitters and other industry partners).

- Develop shared value partnerships to raise the awareness of ERA's strengths and credibility as an organization that reduces GHG emissions and is contributing to a lower carbon world.

Incorporate information and learning to improve ERA's intake, evaluation and funding processes.

- Continually review and revise Board and management operating activities and practices to maximize contribution to GoA priorities.

Align operating activities and budget with GoA priorities, policies and procedures.

- Operate efficiently, effectively and transparently to ensure accountability to stakeholders.

WHAT WE SEEK TO ACCOMPLISH

Increase operational effectiveness and efficiency in ERA's decision-making cycle.

- Decrease turnaround time from the beginning of a call to the approval of funded projects
- Demonstration of measurable organizational results aligned with stated goals and budgets.

Increase capital for innovation and technology.

- Investment is leveraged to create larger pools of capital for innovation and technology than would otherwise be available.

WHERE WE PLAN TO HAVE AN IMPACT

More efficient and effective use of publicly funded programs focused on stimulating GHG emission-reducing technology deployment.

- Increased confidence in government to wisely reinvest carbon levy funds.

Demonstrated innovation and clean technology leadership and partnership through active leverage of collaboration and funding.

- Increased confidence in ERA's ability to support Alberta's action on climate change.

WHAT WE PLAN TO MEASURE

- Stakeholder awareness and collaborative partnerships
- Operating costs as a percentage of approved project commitments
- Length of ERA intake and decision-making cycle
- Leveraged investment

2.0 ABOUT OUR ORGANIZATION

2.1 WE ARE EMISSIONS REDUCTION ALBERTA

Our organization was created in 2009, to help deliver on the Province's Climate Leadership goals.

We invest in the demonstration and deployment of innovative technologies to help create a sustainable and diversified economy that attracts investment, creates jobs, expands market access, and delivers improved environmental outcomes.

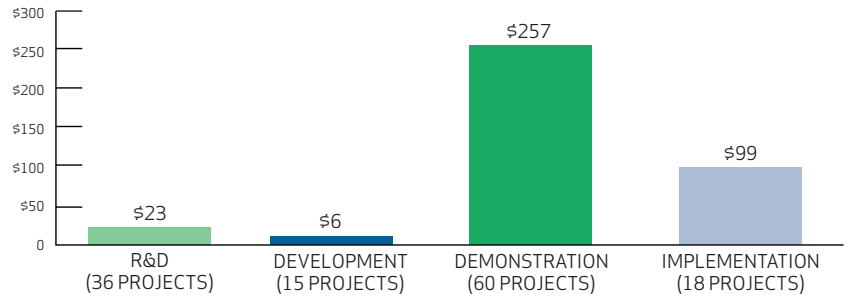
Guided by Alberta's CCITF, our investments reflect the policy objectives of the Province's Climate Leadership Plan. ERA is an integral player in achieving the ambitious climate change and innovation goals of the Province.

While many jurisdictions have a mechanism to invest in clean technologies, 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 the CCIR.

Since 2009, ERA has committed $385 million in funding to 129 projects. ERA funding is leveraged, and for every dollar we invest, more than another five dollars are also invested by industry, innovators and other project funders.

ERA's interest is in reducing GHG emissions, removing barriers to technology development and commercialization, and sharing the knowledge gained to accelerate the development of the technologies Alberta needs to meet its climate change goals. Historically, ERA's investments have spanned the innovation spectrum, but going forward under the CCITF we will largely focus on demonstration and deployment projects.

ERA INVESTMENT BY INNOVATION STAGE (ALL PROJECTS)
($ MILLIONS)



As an arms-length Delegated Administrative Organization, we are well placed to deal with the risks of innovation, including failure. Our independent, transparent and rigorous due diligence and selection process is designed to minimize this risk. When projects are not successful we focus on the lessons learned, sharing the knowledge we gain from those experiences with others who may innovate more quickly as a result.

ERA GOVERNANCE

- Climate Change and Emissions Management Fund Administration Regulation renewed to 2021
- Memorandum of understanding (MOU) renewed to 2021
- Grant Agreement renewed to 2020

ALBERTA'S CLIMATE AND INNOVATION POLICY CONTEXT

Alberta's Climate Leadership Plan is a made-in-Alberta strategy designed to diversify our economy, create jobs and reduce GHG emissions. ERA's investment portfolio includes projects that are aligned with the desired outcomes of the Climate Leadership Plan. For example, ERA is helping Alberta to implement renewable energy technology and encourage adoption of low emitting electricity supply.

Alberta has also developed two frameworks to help guide the Province's actions and investments in technology and innovation: the CCITF and the ARIF. The CCITF serves as the overarching guide for the investment of public funds from the pricing of carbon emissions in clean innovation and technology. The ARIF establishes a suite of aspirational innovation targets intended to inspire collective action to develop transformational solutions that improve the lives of Albertans.

These guiding policy frameworks make ERA's path forward clear. We are an integral part of Alberta's strategy for achieving its climate change and innovation goals, which will result in sustainable prosperity for Alberta.

CLIMATE LEADERSHIP PLAN TARGETS:

Starting in 2017
Annual oil sands emissions are <100 Mt.

2025
Annual methane emissions from upstream oil and gas are decreased by 45 per cent from 2014 levels (14 Mt GHG emissions ↓).

2030
Pollution from coal-generated electricity is ZERO (17 Mt GHG emissions ↓).

2030
30 per cent of electricity produced in Alberta is from renewable energy sources (7 Mt GHG emissions ↓).

ARIF 2030 INNOVATION TARGETS

The GoA is setting aspirational, yet achievable, innovation targets to achieve by 2030. These include:

Grow Alberta's Green Economy
Support the cleantech sector to increase industry sales revenue by 25 per cent, thereby increasing Alberta's global market share by 20 per cent

Reduce GHG Emissions
Support Alberta's climate change goals by accelerating solutions to reduce methane emissions by 45 per cent by 2025 and ensure a dynamic portfolio of GHG emission reduction technologies (2014 base)

Increase Value & Market Access
Support the successful commercialization of new value-added products to increase the market value of Alberta's oil and gas exports by 25 per cent and expanding access to market

Improve Oil Sands Efficiency
Oil sands production efficiency and economics improve by decreasing fresh water use by 50 per cent, GHG emissions by 50 per cent on a per barrel basis and supply cost of bitumen to be globally competitive

Renewable Energy
Renewable sources, like wind and solar, will contribute 30 per cent of Alberta's electricity generation

Drive Bioindustrial Investment
Industry operating in the value-added bioindustrial sector will attract an additional $3 billion private sector investment in Alberta

2.2 WE ARE REDUCING EMISSIONS AND DRIVING ECONOMIC GROWTH

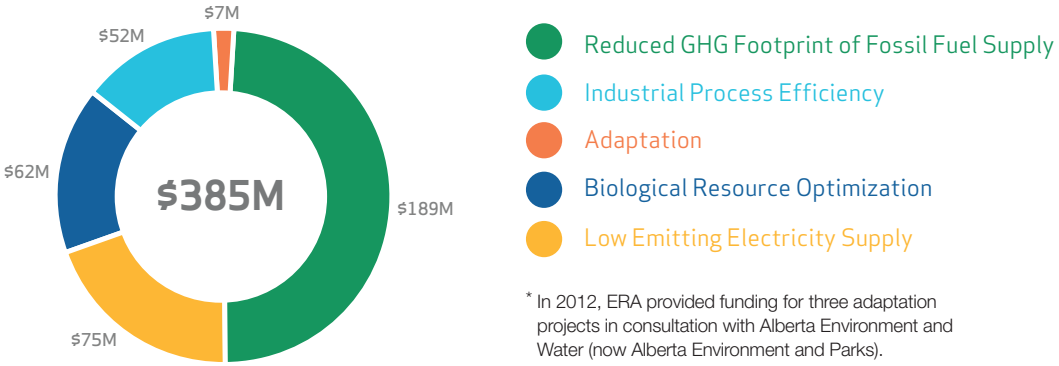
Alberta's vision is that innovation and clean technology will accelerate the Province's shift to a lower carbon economy, generating both environmental and economic benefits. Without a doubt, meeting the world's growing energy demand while reducing GHG emissions requires innovation and transformative technologies. Incremental improvements and energy efficiency gains that allow us to do the same things better are essential, especially in the near-term, but they alone will not get us where we need to go. Deployment of next generation technologies is a critical component of a global solution to address climate change in the long-term.

ERA projects are estimated to achieve nine megatonnes in cumulative net emissions reductions by 2020, with additional market potential[4] of more than four megatonnes by the same year. By 2030, ERA's projects are estimated to achieve 28 cumulative megatonnes of reductions.

ERA projects have positive economic impacts, as well as environmental benefits, in Alberta and Canada. Over 90 per cent of ERA's investment portfolio is Alberta-based (97 projects). More than half of ERA's projects, representing a total commitment of $180 million, are led by small- and medium-sized enterprises (71 projects).

ERA's investments also result in increased economic activity and employment. A 2017 study by Alberta's Department of Economic Development and Trade[5] found that during the ten-year period from 2011-2021, ERA projects are expected to result in direct economic benefits to Alberta of approximately 4,000 person-year jobs and $485 million of GDP growth. The total economic impact of ERA investment, including indirect and induced impacts,[6] is estimated to be an increase of approximately $1.8 billion to Alberta's GDP, with more than 15,500 person-year jobs added over the same period.[7] Since this analysis was undertaken, ERA's portfolio has grown by a net of 20 projects, representing $388 million in net total project value, largely from ERA's Methane and Oil Sands Innovation Challenges. As a result, these economic impact values are significantly understated. ERA proposes to work with the Department to refresh this analysis in the coming year.

ERA FUNDING BY STRATEGIC INVESTMENT AREA



* In 2012, ERA provided funding for three adaptation projects in consultation with Alberta Environment and Water (now Alberta Environment and Parks).

[4]Market potential is calculated by ERA to estimate emission reductions that might be expected to occur under forecast market conditions. Considerations include 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.

[5]Using Statistics Canada's input-output model.

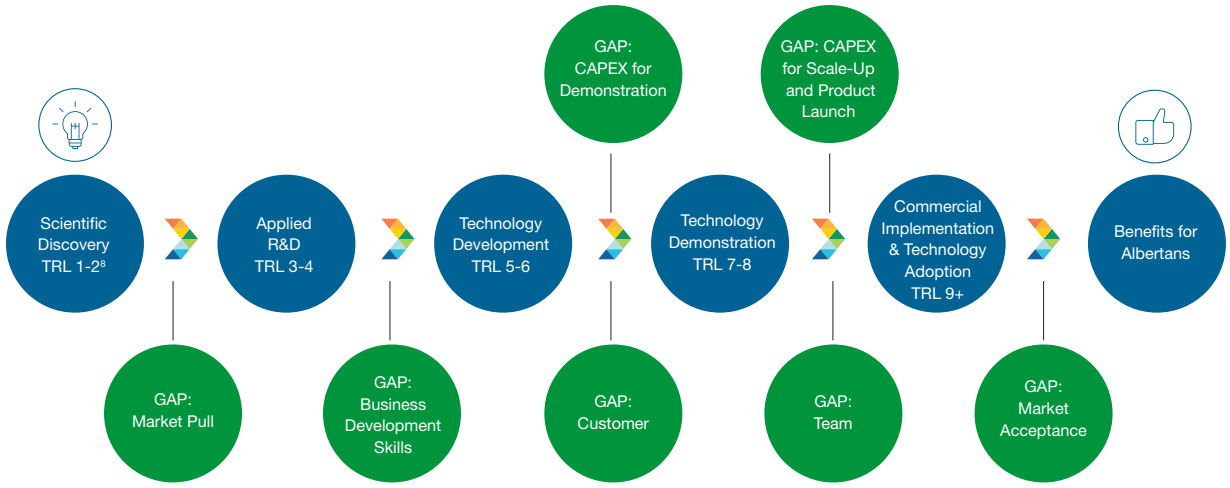
[6]Direct impacts are those directly from the projects; indirect impacts come from the demand created by project investment; induced impacts are residual impacts to the economy.

[7]Provincial GDP increase is less than total investment. Although projects may be located in Alberta, some goods and services are provided to Alberta-based projects by other provinces, resulting in spillover effects.

2.3 WE ARE ALIGNING EFFORTS THROUGH A COMPLETE SOLUTIONS APPROACH

Today, innovators face significant and numerous system gaps that hinder technology scale-up and adoption by industry. Public funding is 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.

INNOVATION SYSTEM GAPS



Market Pull and Policy Push

For new technology to become commercialized, it must provide a solution that the market needs. Policy and regulation, such as carbon pricing and performance standards, can create incentives for industry to seek out opportunities to improve operations, reduce costs and find efficiencies. ERA invests in solutions that tackle the problems Alberta must solve today, while also seeking out transformative technologies to address Alberta's largest GHG sources over the longer-term.

Business Development and Competency Gaps

Even with strong demand from the market, deployment of new technology requires a successful business model. Furthermore, business models must identify a first customer for the solution—ideally a business that is willing to partner to demonstrate or validate the technology.

A potential solution also needs the right team assembled around it—one that can consider the innovation lifecycle from supply chain management through to commercialization.

Lack of Scale-Up Capital

Countries are investing billions of dollars in climate change innovation and Alberta's emissions and energy challenges require a scale of investment that is commensurate with its climate leadership ambitions. Furthermore, clean energy technologies in particular require significant capital investment to develop and commercialize.

[8]ERA does not fund Scientific Discovery.

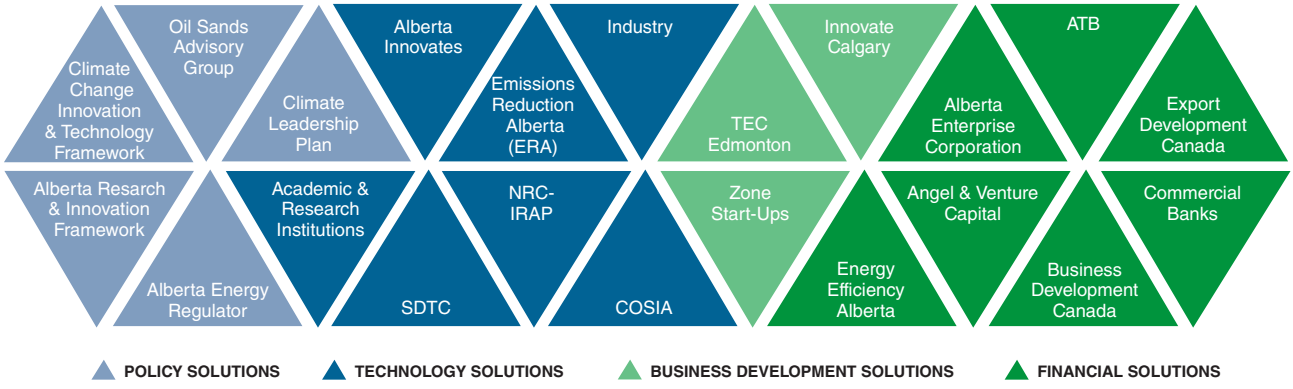
Lack of capital investment for demonstration, scale-up and product launch can impede development, since the ultimate customers for a technology are often unwilling to take on the risk inherent in these stages. To exacerbate this issue, development companies are typically not able to access traditional bank financing at this stage.

Directing public money to demonstration projects can help to de-risk private sector investment. However, some of these technologies are now at a development stage where significant capital is still required before private financial institutions will invest. While these may be promising technologies, they are struggling to access the level of large patient capital that is required to move to commercialization.

A Complete Solutions Approach

To support economic diversification, job creation, education, training and climate change action, ERA will work in close alignment with the evolving Alberta innovation system. We will do our part to create complete solutions, including informing the suite of policy, regulatory, program and business innovation tools required to address system gaps and deploy new technologies. By putting 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 to turn ideas into products, and products into companies.

COMPLETE SOLUTIONS



The private sector is also getting involved through unique models like the Clean Resource Innovation Network (CRIN), a collaboration among Canada's oil and gas industry, innovators, technology vendors, academia, research institutes, financiers and government. By working to align priorities, address gaps and promote innovation, CRIN hopes to accelerate the commercialization of ground-breaking technologies through investments in research, testing and large scale field pilots to deliver energy with a lower environmental footprint and higher productivity.

3.0 STRATEGIC PRIORITIES

ERA is supporting Alberta's climate change goals by focusing its efforts on three strategic priorities:

1 **ACCELERATE TECHNOLOGY**

Seek out and fund the demonstration and deployment of impactful technology solutions.

2 **DRIVE COMMERCIALIZATION**

Convene the "complete solutions" needed to turn ideas into products and products into companies.

3 **MAXIMIZE IMPACT**

Invest public funds wisely and responsibly, through investment leverage and excellence in operations.

The sections that follow highlight some of the key initiatives and actions required to deliver on these priorities and fulfill our mandate. Critical for delivering on these three priorities are ERA's three strategic platforms —communications, partnerships and performance measurement. These are described in more detail in section 4.0.

3.1 ACCELERATE TECHNOLOGY

Accelerating technology by seeking out and investing in innovative GHG-reducing solutions is at the core of ERA's business. These investments are guided by our Technology Roadmap—a living document that defines technology pathways and areas of focus for ERA's funding.

The Roadmap:

- Defines potential innovation and technology pathways for achieving desired climate change policy outcomes
- Specifies the tactical options and initiatives to deliver needed solutions for each pathway
- Identifies potential high impact technology investments that can help demonstrate Alberta's climate change leadership.

ERA investments are typically identified through our competitive call for proposals process. However, projects can also be brought forward for consideration by trusted funding partners through our Partnership Intake pilot. All of ERA's potential investments are assessed against a set of transparent criteria and undergo a rigorous due diligence review to select projects for funding that can best deliver on our mandate and Technology Roadmap.

The Roadmap can help align the broader innovation system to deliver meaningful GHG reductions in Alberta. If successful, the Technology Roadmap will assist the innovation system in focusing on common climate change and innovation goals, technology pathways and priorities, and defined implementation timeframes.

ERA has identified four areas of focus for 2018-2021 as a result of its work to-date on developing the Technology Roadmap:[9]

AREAS OF FOCUS	POTENTIAL INITIATIVES
Reduced GHG Footprint of Fossil Fuel Supply	• Advanced recovery • Fugitive emissions • Partial upgrading • Electricity oil sands integration • Beyond combustion • Carbon capture utilization and storage Transformative technologies and innovation to reduce the GHG footprint of the fossil fuel supply chain and reduce methane emissions while reducing production costs.
Low Emitting Electricity Supply	• Co-generation • Advanced grid management technology • Geothermal • Wind, Solar • Storage • Hydropower Technology and innovation to reduce the GHG footprint of Alberta's electricity supply mix and add more non-emitting supply to meet overall demand.
Biological Resource Optimization	• Biofuels • Bioproducts - materials • Bioenergy • Carbon retention • N_2O & CH_4 emissions • Waste management Technologies and processes for biological resource optimization in supporting energy system transformation, such as biofuels, bioproducts and carbon retention opportunities.
Industrial Process Efficiency	• Industrial efficiency • Process improvements • Low grade heat utilization • Products of CO_2 Industrial process efficiency technologies to deliver GHG reductions through opportunities such as energy conservation, energy efficiency and industrial process innovation.

ERA's Technology Roadmap is a continuous process designed to support a flexible and nimble organization that can adjust to new information, new challenges and new opportunities.

[9]Some initiatives could fall under multiple areas of focus.

Funding Criteria and Selection Process

ERA's calls for proposals use a rigorous three-stage process to ensure that our funds are invested prudently.

1 EXPRESSION OF INTEREST (EOI) STAGE

Public Call for EOIs → EOI Submission → Expert Team Evaluation → Shortlist Decision → Decision Letter to Applicants

2 FULL PROJECT PROPOSAL (FPP) STAGE

FPP Submission → Oral Presentation → Expert Team Evaluation → Board Decision → Decision Letter to Applicants

3 PROJECT EXECUTION STAGE

Work Plan Finalization → Contribution Agreement → Project Monitoring → Progress Reporting → Sharing of Results

FAIRNESS MONITOR

The entire ERA evaluation process involves participation by an independent Fairness Monitor that reports directly to the ERA Board of Directors. The Monitor ensures that all applicants are treated in a fair and equitable manner. The Fairness Monitor's findings are presented to ERA's Board of Directors before any funding decisions are made.

Partnership Intake Pilot

ERA's call for proposals process is effective and efficient for evaluating multiple opportunities and for comparing the relative merits of different opportunities side-by-side. However, the scope and timing of ERA's call for proposals process has resulted in some challenges and missed opportunities.

Examples of instances where challenges may occur include:

- Projects that receive funding from ERA and one or more partnering organizations often undergo multiple lengthy and sometimes duplicative due diligence processes
- ERA is sometimes presented with strong opportunities through partnering organizations, but is unable to evaluate these opportunities in a timely manner because the next call for proposals is not open or is not aligned by focus area
- ERA often evaluates proposals that are strong, but contain weaknesses that do not result in a funding recommendation. If applicants are able to addresses weaknesses, they may have a timely opportunity to re-enter into the ERA funding process.

To address these challenges and develop greater flexibility, ERA has undertaken a Partnership Intake pilot on a trial basis that allows proposals from "trusted partners" to be evaluated and considered for funding in an ongoing manner. 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 due diligence.

To date, ERA has established trusted partnerships with Alberta Innovates, Energy Efficiency Alberta, the University of Calgary, the University of Alberta, the Northern Alberta Institute of Technology (NAIT), SDTC, NRCan, Ontario Centres of Excellence, the Canadian Gas Association and Evok Innovations. A partnership is also under development with the BC Innovative Clean Energy (ICE) fund.

Technology Scouting

ERA has a rigorous process to make certain that the best opportunities are selected for funding. Historically, only opportunities that were submitted under one of our calls for proposals could be considered for funding. Consequently, the quality of projects funded by ERA is entirely dependent on the selection of opportunities presented to ERA. We are becoming more proactive in our approach to seeking out and identifying the most impactful opportunities for technology investment.

For example, the Partnership Intake pilot provides several channels for ERA to become aware of opportunities and engage with innovators that might not otherwise have the opportunity to submit proposals. In addition, ERA has purposefully engaged in targeted outreach with a multitude of critical stakeholders to direct its calls for proposals at relevant and timely gaps that can be addressed through nascent technologies.

ERA will build on these improvements and further develop technology scouting capacity. By actively seeking out innovative solutions under development, we will ensure that the best technologies are accelerated and tailored to meet the evolving needs of the Province.

Future Funding Opportunities

ERA seeks out and invests in solutions that reduce GHGs, align with the outcomes of the Climate Leadership Plan and CCITF and respond to market needs. The GoA announced in December 2017 that it will provide ERA with an additional $80 million in core funding to accelerate the demonstration and deployment of promising GHG reducing technologies and game-changing innovation. The government has also committed to providing ERA with a further $92.5 million for additional initiatives that will result in nearer-term, incremental reductions, including $77.5 million for industrial efficiency, and $15 million for areas including community generation and methane reductions.

ERA's funding is made available primarily through the delivery of targeted funding opportunities. These competitive calls for proposals will be augmented by our Partnership Intake pilot. The following sections describe several specific areas of interest that ERA is exploring for its future funding opportunities, based

on the policy direction provided by the Climate Leadership Plan and CCITF, and the priorities and guideposts laid out in our Technology Roadmap.

1. Industrial Efficiency Technologies

In December 2017, the GoA announced it would be providing $240 million for industrial energy efficiency programs to help the commercial and industrial sectors lower emissions and energy use, which will result in reduced costs. Of this funding, $35 million is being administered by ERA under our Industrial Efficiency Challenge. Launched in March 2018, this call for proposals will support the demonstration and deployment of industrial process efficiency technologies.

ERA and the GoA are also working with Environment and Climate Change Canada (ECCC) to secure additional funds for the Industrial Efficiency Challenge through the federal Low Carbon Economy Leadership Fund. If ERA's proposal to this federal fund is accepted, an additional $8 million will be granted to ERA from the GoA and will be reimbursed by a contribution from ECCC in the 2021-22 fiscal year.

Given the significant opportunity that exists to reduce emissions at large final emitter facilities, the GoA has granted ERA a further $34.5 million to support additional application-based programming for near-term, on-site GHG emissions reduction technologies at facilities impacted by the CCIR. With this support, large emitter facilities can reduce emissions and energy use, helping them remain competitive in a low-carbon global economy.

RECENT ERA FUNDING OPPORTUNITIES

ERA's Technology Roadmap provides us with areas of focus for investment and guideposts to help shape our portfolio.

Based on this direction, ERA made $40 million available for technologies that monitor, detect and reduce methane emissions in October 2016.

In March 2018, we made $35 million available for technologies that improve industrial process efficiency.

In May 2018, ERA announced $70 million in funding for technologies that reduce GHG emissions in Alberta's oil sands.

2. Technologies to Support a Low Carbon Electricity System

The Climate Leadership Plan commits to putting an end to coal-fired power emissions and transitioning to cleaner sources of electricity. Coal was historically a low-cost source of electricity. The CCITF identifies a low carbon electricity system as a potential clean technology sector opportunity area for investment, and the Province is putting numerous programs in place to help support the transition. In 2014, Alberta's electricity sector accounted for 16 per cent of Alberta's total GHG emissions. The majority of these emissions were from coal-fired electricity generation.

In partnership with the electricity sector, ERA can help accelerate and de-risk technologies to transition away from coal. Opportunities exist for innovative technologies to support Alberta's climate goals, including:

- Harnessing renewable and low GHG energy sources
- Developing community generation, energy storage, and distributed energy technologies
- Generating electricity from biological resources or geothermal fuel sources.

ERA will work closely with government ministries, the Alberta Electric System Operator (AESO) and industry to understand the opportunities to accelerate technology that can respond to the policy and regulatory signals to phase-out coal-fired electricity generation, increase renewable energy and address the technology needs of Alberta's market.

3. Technologies to Enhance Sustainable Mobility

Transportation is among the largest sources of GHG emissions in Alberta and represents an important area of opportunity for innovation and technology advancement. In 2014, 16 per cent of the Province's GHG emissions came from the transportation sector.

Alberta's CCITF identifies sustainable mobility as a potential clean technology sector opportunity area for investment, and Alberta's 2016 Climate Leadership Progress Report emphasizes the importance of reducing GHG emissions and supporting public well-being through increased usage of low-emission transportation.

In addition to helping to address climate change, technologies to reduce GHG emissions from transportation often result in substantial societal and environmental co-benefits, particularly in dense urban areas. For example, reducing emissions from internal combustion engines usually results in local air quality improvements from reduced particulate emissions, while electric transit buses are much quieter and reduce noise pollution.

Opportunities exist for ERA to support the demonstration and deployment of innovative technologies that can enable more sustainable mobility options, including renewable fuels production, technologies to increase transportation efficiency, and opportunities to improve transportation infrastructure and traffic management, such as analytics and machine learning.

4. Technologies to Optimize Biological Resources

Innovative technologies for biological GHG emissions management offer important investment opportunities for ERA. Agriculture, forestry and waste management result in the release of biological-source GHGs of approximately 25 megatonnes annually. This includes:

- Methane from livestock digestion and manure
- Nitrous oxide from fertilizer and crop residue
- Methane from landfill gas and biosolids
- Carbon dioxide from the use of fossil fuels and liming
- Forest industry and waste management emissions.

The use of biological processes and products to replace fossil carbons or "biocleantech" holds significant promise to reduce emissions from numerous sectors. Areas of opportunity for Alberta include using:

- Agricultural and forest residues and municipal wastes to produce renewable natural gas
- Biomass co-generation for district heat and power and industrial process heat (oil sands in situ for example)
- Biofuels for the transportation fleet
- Substitution for coal in electrical energy, cement and lime production
- Biocrude upgrading.

Biological sectors also offer opportunities to reduce emissions through carbon retention. The land can act as a sink, sequestering emitted anthropogenic carbon through practices like avoided deforestation, afforestation and "negative emissions" technologies such as bioenergy with carbon capture.

Technologies that monitor, collect, aggregate and analyze spatially explicit emissions data are also important for improved GHG management in land, forestry and agriculture. Further, such technologies are critical to a complete solutions approach for this sector that will support business development, policy creation, provincial reporting and development of regulations and incentives relating to biological systems.

ROUND THREE OF THE ERA GRAND CHALLENGE: INNOVATIVE CARBON USES

ERA's Grand Challenge was designed to scan the globe for ideas that could be used in Alberta to turn carbon dioxide waste streams into valuable products. The ultimate aim is to commercialize a technology in Alberta that has the potential to provide a net GHG reduction of one megatonne (1,000,000 tonnes) annually.

ROUND ONE: In spring of 2014, ERA awarded up to $500,000 to 24 projects to prove out early stage concepts.

ROUND TWO: In spring of 2017, we narrowed the field to four recipients who each received commitments of up to $3 million to advance their technologies.

ROUND THREE: In spring of 2019, we will begin the process to award one of the four groups from Round Two a grant of up to $10 million to advance their technology in Alberta.

3.2 DRIVE COMMERCIALIZATION

Although ERA's core business is seeking out and investing in technology solutions, funding the right technologies alone will not deliver the ambitious climate and innovation goals Alberta has established. Clean technologies face significant challenges on the pathway to commercialization, and addressing these challenges requires a complete solutions approach, including smart financing and strong business models, and creating an effective and efficient environment where good policies and strong regulatory frameworks enable us to deliver results.

To advance technologies towards commercialization, ERA will play a role not only as a funder, but also in engaging in complementary strategies being developed by government, providing mentorship, and convening organizations that promote innovation in Alberta and across Canada.

Enabling Regulatory and Policy Environments

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

ERA actively works with government to support the development of policy and programs related to climate change and innovation. We were one of numerous organizations that informed the development of the CCITF, which will be instrumental in guiding policy, programs, and investment in innovation and technology that reduce GHGs while preparing our Province for the lower carbon 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 methane project proponents to ensure regulation is not a barrier to developing and deploying technologies to monitor, detect and reduce methane emissions.

ERA also worked closely with Energy Efficiency Alberta, the Alberta Climate Change Office, and multiple other departments and agencies to help government develop a comprehensive suite of industrial energy efficiency programming to reduce GHGs and improve the competitiveness of Alberta's industry. This work was informed by a multi-stakeholder workshop hosted by ERA in August that brought together government, industry, technology developers, academia and others to discuss Alberta's opportunities and challenges in the industrial efficiency space.

This model of bringing together the best and brightest to understand the needs of industry, and formulate funding opportunities that address both government and market needs, has become common practice for ERA.

Supporting Innovators on the Path to Commercialization

The innovation system in Canada and Alberta is complex, yet rich in resources and capacity. ERA is uniquely 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, it is common practice for ERA to assign 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 technological readiness challenges.

ERA also incorporates commercial potential criteria for each project into funding applications and contribution agreements. To enhance this perspective, ERA works jointly with Calgary Technologies Inc. and TEC Edmonton (CTI.TEC). CTI.TEC jointly supports ERA proponents alongside Alberta Innovates and participates in the upfront project review process.

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

Through our call for proposal process, ERA often identifies projects or technologies that show promise but are not ready for funding due to specific challenges. ERA is working with CTI.TEC and Alberta Innovates to develop a pilot that would help identify barriers to commercialization and the resources required to overcome these barriers. This "Innovator Support Pilot" capacity will leverage the knowledge of existing entities and experts in the innovation ecosystem, with ERA providing a triage and connecting function. Initiating this process prior to funding will allow us to identify and address barriers before entering into a contribution agreement. This will ultimately lead to more successful funded projects and fewer stranded grants.

Learning by Doing

In November 2017, ERA initiated a research project to determine the level of awareness, familiarity and support for ERA and its mandate. Through in-depth interviews with key stakeholders and a survey of informed Albertans, we uncovered a new opportunity: ensure the findings of funded projects are utilized.

We publish final reports for projects, share successes through our annual reports and provide shorter project summaries on our website. ERA has an opportunity to better understand the lessons learned and to share these learnings with those who may be able to innovate faster as a result of this knowledge translation.

ERA is developing a plan to host learning sessions with past project proponents as well as feature larger workshops for entire sectors who may benefit from participation in these activities.

3.3 MAXIMIZE IMPACT

ERA is funded by the GoA through the carbon levy paid by Alberta's industrial large final emitters. Our organization is committed to investing these public funds wisely and responsibly, and has had a continued focus on efficient and effective operations. We will continue to seek out opportunities to maximize value by partnering and leveraging our investments with federal funding programs and other organizations investing in climate innovation.

Leveraging Investment

The 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 five dollars are also invested by industry, innovators and other project funders.

Actively seeking out funding partners who desire similar outcomes as ERA can help to maximize the value of our investments, allowing for significant and sustained resources to support the development, implementation 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.

The 2017 Federal Budget included numerous funding programs to support clean technology, including the NRCan Clean Growth in Natural Resources Program, SDTC's SD Tech Fund, and ECCC's Low Carbon Economy Leadership Fund. ERA has established collaborative relationships under our Partnership Intake pilot with both NRCan and SDTC which allow us to explore potential co-funding opportunities under these and other programs. We are also exploring the opportunity to leverage investment from the Low Carbon Economy Leadership Fund for our industrial efficiency call.

Private funders can also provide investment leverage, including:

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

Under our Partnership Intake pilot, ERA will seek to leverage its investment through co-funding of projects with trusted partner organizations like these.

Ongoing Operational Improvements

ERA has a responsibility to ongoing operational improvements, including discretionary and operational expenditures. While ERA's operating budget has always been lean, we have consistently sought opportunities to reduce the overall operating budget for the organization. Our 2016/17 operating budget was 30 per cent lower than the approved 2015/16 operating budget. Actual operating expenses in 2016/17 were 16 per cent lower than the approved budget for that year and 11 per cent lower than actual operating expenses in 2015/16.

A further four per cent reduction was made in the 2017/18 operating budget from the approved 2016/17 budget.

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. However, every good business delivery model requires review and assessment to ensure it is providing the best possible value.

ERA expects that these efforts will contribute to actual expenditures for 2017/18 that are approximately 25 per cent less than the approved budget. For the development of our 2018/19 budget, service providers have been advised that there will be no increase in per unit service provider rates, and further suggestions for operational cost savings have been encouraged. We are also systematically going out to the marketplace with requests for proposals for core services to ensure we are receiving the best value for money.

In 2016-17, we improved the efficiency of the evaluation and approval process for the ERA Methane Challenge, shortening the process by 60 days.

Efficient Intake Process

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. However, to be effective, the process must also be efficient—that is, we need to make funding decisions efficiently and create a process that is not unduly onerous or time consuming for applicants. In the past, the duration of the process has been identified as a barrier to some applicants' success.

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 pilot also provides opportunities to improve the efficiency of our intake process. It provides credible technology developers more timely access to ERA funding and allows ERA to:

- Leverage our trusted partners' due diligence processes
- Develop capacity and processes for evaluating applications on an ongoing basis.

The pilot will also help inform the benefits and resource requirements for consideration of a continuous intake model in the future.

4.0 STRATEGIC PLATFORMS

Core to our effectiveness is our ability to articulate the challenge of reducing GHG emissions, and explain ERA's role in identifying and accelerating the innovative technologies that will help deliver a low carbon future. We have a compelling story to share—with our partners who will collaborate with us, and our stakeholders who can share and spread our successes and learnings. In 2018-2021 we will put an increased focus on strengthening our communications, building upon our partnerships and measuring our success to harness the power of the innovation ecosystem.

4.1 COMMUNICATING SUCCESS

In November 2017, ERA conducted research to determine the level of awareness, familiarity and support for ERA and its mandate. We completed:

- A test of general public opinion (802 Albertans)
- A survey of key stakeholders (434 informed Albertans)
- In-depth interviews with 20 trusted partners and stakeholders.

Based on this research, we identified six opportunities for improvement:

1. **Increase visibility** on a national and global level of ERA as a leader in the demonstration and deployment of technologies that reduce GHG emissions.
2. **Increase collaboration** with funders and like organizations nationally and internationally—more leveraging of funding and partnering where goals are aligned.
3. **Grow continuous intake** as well as Calls for Proposal on a specific theme.
4. **Continue to engage with allies** and ensure they are aware of the successes of ERA, so that they can spread the word about ERA as well.
5. **Increase transparency** at the adjudication stage—share more information about how proposals are adjudicated and provide more feedback for unsuccessful proposals.
6. **Ensure the findings of funded research are utilized**—if they are successful, aid them in finding partners to move the project through to commercialization; if they are unsuccessful, ensure the findings can be used to benefit future research.

FUNDING OPPORTUNITY WEBINARS

Shortly following the launch of both the ERA Methane and Oil Sands Innovation Challenges, we hosted webinars to provide additional information about our application process, the focus of the funding opportunities and the specific criteria associated with the calls. Over 240 and 195 people participated in the two webinars, respectively.

The webinars help ERA build awareness of our funding calls and provide an opportunity for prospective applicants to ask questions and better understand our process. Going forward, these webinars will be standard practice for ERA.

A robust communications strategy is critical to successfully delivering on our mandate and on the government's desired outcomes. Our communications activities allow us to raise ERA's profile beyond that of just a funder—we are a convener of complete solutions. It also allows us to secure the highest quality EOI submissions, ensuring the projects we selected for funding are among the best-of-the-best.

Effective communications helps us make certain our trusted partners and key stakeholders understand our processes, and benefit from lessons learned as a result of our projects. This also helps us develop and retain strong advocates in the system, who would recommend ERA as a partner to advance technologies to reduce GHGs.

4.2 BUILDING COLLABORATIVE PARTNERSHIPS

Partnerships are central to our success, which is why ERA is working collaboratively with government, industry and other stakeholders to secure a lower carbon future for Alberta.

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 for our Province
- Leverage funds
- Share risk
- Accelerate technology development.

Partnerships are critical to delivering a complete solutions approach, helping us to convene the right resources and bridge the gaps on technological, business development, financial resources and capacity challenges.

Our ongoing relationship with the newly consolidated Alberta Innovates is critical to achieving our strategic and operational goals. More importantly, the partnership provides the innovators and technologies we fund with a simplified means for accessing our resources and supports.

We have learned a great deal through collaboration, and partnerships will continue to play an important role as we fulfill our mandate. We will seek to strengthen existing partnerships with organizations like like SDTC and Canada's Oil Sands Innovation Alliance (COSIA), as well as look to develop new collaborative relationships with academic and research institutions, federal organizations such as NRCan, and financial institutions like ATB and Business Development Canada (BDC), who are exploring opportunities for clean technology investment and green financing.

ERA STAKEHOLDER RESEARCH HIGHLIGHTS

The most engaged key stakeholders hold very high regard for the ERA mandate, staff and leadership and feel working toward a lower carbon economy is critical to the future of Alberta.

Albertans generally cannot name an organization working to reduce GHGs, yet 83 per cent support ERA's mandate.

60 per cent of key stakeholders are very aware of ERA; with 70 per cent awareness of ERA's goals.

Two-thirds of stakeholders would recommend others apply for funding through ERA.

4.3 MEASURING PERFORMANCE

Performance management is critical to demonstrating that ERA is delivering on its mandate, and living its core values. Relevance, quality and timeliness are important dimensions of measuring and communicating our performance, and ERA understands the need for ongoing development and process improvement for sharing results with our partners.

ERA is a well-established delivery agent of the Climate Leadership Plan and CCITF, and our efforts are aligned with defined provincial, national and international metrics. Our Business Plan and Annual Report are key tools for ERA to communicate how we are delivering on our commitments. Additionally, ERA produces a quarterly Stewardship Report, which provides more frequent updates to government and the public on our current portfolio, investments and performance.

ERA reports on an annual basis to the Alberta Climate Change Office regarding its contribution to Climate Leadership Plan outcomes, objectives and targets. ERA worked closely with the Climate Office to support the development of its first Climate Leadership Plan Progress Report.

ERA's primary mandate is accelerating technologies that reduce GHG emissions in Alberta. To demonstrate and communicate how we are delivering results, ERA is committed to establishing and reporting on portfolio-based performance outcomes and measures. These include quantification of our projected or estimated "return on investment" in terms of GHG emission reductions at a portfolio level. We track and report these metrics on a cumulative and annualized basis.

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 the outcomes of the Climate Leadership Plan and CCITF are aligned in striving to deliver a lower carbon, diversified economy and enhanced well-being for Albertans.

The Province has also committed that the revenue generated from the carbon price will be reinvested into Alberta's economy. While ERA's mandate allows us to invest in technologies from anywhere in the world, we require that there is a demonstrated benefit to Alberta. As a result, 93 per cent of ERA's funding goes to Alberta-based projects. Furthermore, we have committed in our Grant Agreement that we will report to the Province any cases where ERA has identified a promising investment opportunity from outside Alberta's borders, and will clearly indicate the specific benefit to Alberta derived from that investment.

ERA is working with the Province under the CCITF to establish goals and metrics that also quantify our expected contributions to Alberta's desired economic and societal outcomes, including economic competitiveness, investment attraction and employment.

Metrics Approach

ERA is building a stronger performance measurement approach that is fully aligned with the measurement efforts led by the GoA. ERA has engaged key government departments, including the Alberta Climate Change Office and Economic Development and Trade, to ensure that the goals and activities laid out in our Business Plan directly support the Province's outcomes and objectives around:

- Reduced GHG emissions
- A lower carbon, diversified economy
- Increased community well-being.

ERA currently quantifies and reports projected GHG emissions reductions that will be delivered by our projects, on both a portfolio and cumulative basis. In supporting the development of the Climate Leadership Plan Progress Report, we worked with the Alberta Climate Change Office to ensure that our portfolio-based reporting is in alignment with and supports key systems-level desired outcomes of the Plan. In 2018, we will be working with Economic Development and Trade and Alberta Innovates to share ERA's methodology for estimating GHG reductions from investment in innovation and technology so it can be adopted for measuring performance of programs under the CCITF.

ERA calculates two different but related emissions reductions projections for projects in our investment portfolio. The first is the total of the 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.

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.

In addition to environmental metrics, ERA is improving its reporting on economic and societal outcomes. Two metrics that have been identified as key to these outcomes include gross domestic product and job creation resulting from ERA investments. In 2017, our organization worked with the Department of Economic Development and Trade to estimate the economic impact of ERA's projects and related investments during the ten year period from 2011 to 2021. ERA will continue to work with the department to gather information and report on metrics that will both inform and align with government efforts to measure and quantify contributions to economic growth, investment attraction, and employment.

Given that ERA's investments often deliver results years into the future, many of our performance metrics are forward-looking. However, measuring how closely actual performance compares with our projections is also necessary. ERA is working to develop processes to monitor impacts during and following project completion. These include environmental impacts (domestic and international) as well as economic impacts, such as employment, attracted investment, domestic and export sales. Outcomes will then be compared and reported against forward-looking projections made at the time of investment.

ERA is also working with the Alberta Innovates' Performance Management and Evaluation team to develop an assessment of how technologies within ERA's portfolio have progressed along the innovation spectrum. This work will be important to inform how ERA is helping to accelerate technologies, as well as better understand the broader system challenges faced by our projects' proponents.

5.0 OPERATING BUDGET

Emissions Reduction Alberta (ERA)
2018/19 to 2020/21 Operating Budget

	2017/18 Revised Budget* $	2017/18 Forecast Actual $	2018/19 Budget $	2019/20 Budget $	2020/21 Budget $	
Revenue						
Grant revenue	65,000,000	134,500,000	20,000,000	10,000,000	50,000,000	(a)
Interest income	4,355,392	5,073,770	6,969,167	4,462,012	3,003,252	(b)
Total Revenue	**69,355,392**	**139,573,770**	**26,969,167**	**14,462,012**	**53,003,252**	
Program Expenditures	59,620,403	49,590,451	103,953,053	115,280,621	96,557,859	(c)
Revenue less Program Expenditures	9,734,989	89,983,319	(76,983,886)	(100,818,609)	(43,554,607)	
Operating Expenses						
General & Administrative Expenses						
Corporate costs	80,000	150,000	165,000	168,300	171,666	
Insurance	10,614	11,000	11,000	11,220	11,444	
GST expense	145,000	110,000	125,000	130,000	135,000	
Total General & Admin Expenses	235,614	271,000	301,000	309,520	318,110	(d)
Contractor / Service Provider Expenses						
Administration, financial risk reviews, GhG reviews, project monitoring and internal project audits	1,568,167	1,197,000	1,353,094	1,380,156	1,407,759	(e)
Project review, evaluation and management	1,160,000	650,000	763,597	778,869	794,446	(f)
Legal	400,000	400,000	370,000	377,400	384,948	(g)
Operations	515,000	515,000	675,000	688,500	702,270	(h)
Communications	905,239	835,000	900,000	918,000	936,360	(i)
Commercialization Support	225,000	200,000	209,373	213,560	217,832	(j)
Total Mgmt Support Contractors	4,773,405	3,797,000	4,271,064	4,356,485	4,443,615	
Other Contracted Services and Special Initiatives						
Consulting contracted services	435,000	300,000	435,000	443,700	452,574	(k)
Biological and Strategic Programs	150,000	50,000	-	-	-	(l)
Spark Conference Costs	10,000	50,000	75,000	200,000	204,000	(m)
Total Other Contracted Services and Special Inititatives	595,000	400,000	510,000	643,700	656,574	
Governance						
Board remuneration and expense	75,000	75,000	75,000	76,500	78,030	(n)
Professional fees	45,000	45,000	45,000	45,900	46,818	(o)
Total Governance	120,000	120,000	120,000	122,400	124,848	
Total Operating Expense	**5,724,019**	**4,588,000**	**5,202,064**	**5,432,105**	**5,543,147**	
Surplus / (Deficiency) of Funds for the year	**4,010,970**	**85,395,319**	**(82,185,950)**	**(106,250,714)**	**(49,097,755)**	
Total Funds Under Management - beginning of year	**274,991,432**	**274,991,350**	**360,386,670**	**278,200,720**	**171,950,006**	(p)
Total Funds Under Management - end of year	**279,002,402**	**360,386,670**	**278,200,720**	**171,950,006**	**122,852,251**	
Committed Funds for Approved Projects	**437,218,602**	**438,106,755**	**588,106,755**	**603,106,755**	**653,106,755**	(q)
Total Project Funds paid to date	**(224,563,094)**	**(214,533,144)**	**(318,486,197)**	**(433,766,818)**	**(530,324,677)**	
Remaining Funds required to fulfill approved project commitments	**212,655,508**	**223,573,611**	**269,620,558**	**169,339,938**	**122,782,078**	
Uncommitted Funds	**66,346,894**	**136,813,058**	**8,580,162**	**2,610,068**	**70,173**	
Operating costs as a % of Funds Required to Fulfill Approved Project Commitments	**2.7%**	**2.1%**	**1.9%**	**3.2%**	**4.5%**	(r)

* Revised budget prepared in December 2017 in response to the funding confirmation received from the Government of Alberta.

Notes and assumptions

(a) '*Grant Revenue'* for all three years is forecast to be consistent with recent correspondence from the Government of Alberta with respect to allocations under the Climate Leadership Plan. Allocations include $80 million for the core grant funding anticipated to be distributed as follows: $70 million in 2017/18 and $10 million in 2018/19. In addition, $35 million for Industrial Process Efficiency is anticipated to be distributed as follows: $15 million in 2017/18, $10 million in 2018/19 and $10 million in 2019/20. An additional $49.5 million was received in 2017/18 for initiatives that will be funded by application-based programming for Industrial Process Efficiency for large final emitters, community generation and methane reduction. $50 million has been included as a placeholder for projected grant revenue in 2020/21, however no commitments have been made.

(b) Interest income' has been based on cash flow projections for the Corporation. Interest rate assumpetions are based on interest rates currently being earned by the Corporation at 1.65% for balances up to $100M, 1.75% for balances in excess of $100M, 1.85% for balances in excess of $150M and 1.95% for balances in excess of $200M. The Operating Account rate is 1.65%. This is an increase of 75 basis points from last fiscal. A further increase has been forecast for Q2 2018.

(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'* are expected to increase to include the lease expense of the new office.

(e) '*Administration, due diligence, project monitoring and internal project audits'* costs have been budgeted including efficiencies identified in 2017/18 and updated policy for risk assessments and project assurance functions. It should be noted that the actual results for 2017/18 are lower than both the 2017/18 and 2018/19 budgets as only one funding call was executed in 2017/18 as compared with the two calls proposed for both budgets.

(f) *'Project review, evaluation and management'* costs are anticipated to decrease from last budget due to the movement of the Director of Projects to ERA Operations team. t should be noted that the actual results for 2017/18 are lower than both the 2017/18 and 2018/19 budgets as only one funding call was executed in 2017/18 as compared with the two calls proposed for both budgets.

(g) '*Legal'* costs are anticipated to decrease approximately 8% in 2018/19 as compared to the 2017/18 budget.

(h) '*Operations'* costs are expected to be in line with the current contracts for executive team and includes the movement of the Director of Projects from AI to Operations.

(i) '*Communications'* costs have been contemplated in conjunction with the ERA Communications Plan for FY19. The function is going to tender at the end of 2017/18 and it is expected that efficiencies will be identified for fiscal 2018/19.

(j) *'Commercialization Support'* costs have been budgeted to decrease in FY19 over the FY18 actual costs consistent with fiscal restraint expectations.

(k) '*Consulting Contracted Services'* include research consulting costs to support the RFP process, research initiatives and collaboration projects. FY19 budget will be consistent with prior year budgets.

(l) *'Biological and Strategic Programs'* has been removed in 2018/19 as the Biological program costs are included in Project review, evaluation and management. No other Strategic Programs have been included in the budget.

(m) 'Spark *Conference' was held* in November 2017 and is expected to be held again in 2019. Costs for the current year represent planning costs

(n) '*Board remuneration and expense'* budget remains consistent with the current year forecast.

(o) '*Professional fees'* comprise audit fees and remain consistent with the current year forecast.

(p) Based on Cash flow model for the month ended December 31, 2017. Represents ERA's total funds under management.

(q) 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 and assumptions for Continuous Intake, Call 3 and Call 4. Future approved rounds are based on estimates. Funds are shown as committed once the EOI cycle has started for a particular Call.

	$	
Round 1	54,443,172	
Round 2	24,047,999	
Round 3	10,000,000	
Round 4	36,023,000	
Round 5	4,093,569	
Round 6	6,716,405	
Round 7	25,375,135	
Adaptation	6,990,662	
Biological	4,118,529	
Grand Challenge	33,642,961	*Note: Includes $10 million for Round 3*
Round 8	9,161,141	
Round 9	7,759,675	
Round 10 and Accelerator	59,397,809	
Round 12 -SDTC Joint Call	12,181,402	
Call 1 - Methane Reduction	30,555,296	
Call 2 - Oil Sands Innovation	70,600,000	*Board approval scheduled for February 2018*
Call 3 - Industrial Efficiency	43,000,000	*Board approval scheduled for September 2018*
	438,106,755	

Future Rounds	**$**	
Call 4 - Multiple Focus Area	70,000,000	*Board approval scheduled for February 2019*
2018/19 Continuous Intake and Special Initiatives	80,000,000	
Call 5 & 2019/20 Continuous Intake	15,000,000	*Note: Includes forecast for funding calls and continuous intake*
Call 6 & 2020/21 Continuous Intake	50,000,000	*Note: Includes forecast for funding calls and continuous intake*

(r) 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 is due to the projected decrease in the Grant revenue for these years. The funds required to fulfill remaining commitments will be reduced as project payments continue to be made in accordance with the project plans, however there will be a significant reduction in new commitments in those years due to the decrease in new grant monies. This is coupled by the fact that the majority of ERA's operating costs remain fixed, despite the reduction in new funding commitments being made.