

EMISSIONS
REDUCTION
ALBERTA



CUTTING CARBON.
CUTTING COSTS.

EMISSIONS
REDUCTION
ALBERTA



ERA



TABLE OF CONTENTS

INTRODUCTION	1
WHO WE ARE	2
LEADERSHIP PERSPECTIVES	5
OPERATIONS-AT-A-GLANCE	11
STRATEGIC PRIORITY: ACCELERATE TECHNOLOGY	21
STRATEGIC PRIORITY: DRIVE COMMERCIALIZATION	39
STRATEGIC PRIORITY: MAXIMIZE IMPACT	53
FINANCIALS	61

ERA



Cutting Carbon. Cutting Costs.

The global population is 7.6 billion and growing—increasing demand for energy, food, and water. At the same time, the world needs to reduce greenhouse gas emissions while growing our global economies. We need a lower carbon world.

ERA has developed a vision to help Alberta and Canada achieve this future. We imagine a zero-emissions electricity system. We imagine technologies that reduce the costs of operating our homes, schools, and hospitals. We imagine plant oils that power airplanes. We imagine a future where emissions are captured and used to create everyday products—from chemicals and fertilizers to cement and hockey sticks. We imagine eliminating the need for steam and tailings ponds in Alberta's oil sands. These are the types of actions that will make Alberta a leader in a cleaner, more sustainable world. We need to remain competitive, diversify our economy, and reduce our environmental impact.

WE NEED TO CUT CARBON AND CUT COSTS.

We are ERA. Our plans are big and our vision is ambitious. We have funded 128 projects since 2009, investing \$375 million into technology that helps Alberta grow economically, expand sustainably, and lead environmentally. And, we aren't doing it alone. Our \$375 million is just part of the equation. The projects we have invested in are valued at over \$2.6 billion. This leverage and collaboration is the crux—connecting with like-minded partners with the foresight to fund the people and ideas our future needs will make certain we accelerate the best technologies from concept through to commercialization.

In the pages that follow, you will learn more about how ERA is working to cut carbon and cut costs, and how this effort is driving Alberta toward the future we imagine.

WHO WE ARE

ERA is core to Alberta's innovation ecosystem. Established in 2009, our organization helps the Province and Canada deliver on their climate leadership goals and commitment to the globally significant Paris Agreement.

We invest in the demonstration and deployment of next generation greenhouse gas reducing technologies and bring together complete solutions to support their commercial success. This work lowers operating costs, creating a more sustainable and diversified economy. An economy that attracts investment, creates jobs, expands market access, and delivers improved environmental outcomes.

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.

CORE VALUES

- Leadership
- Innovation
- Collaboration
- Transparency
- Integrity

ERA



LEADERSHIP PERSPECTIVES

FROM OUR MINISTER	6
-------------------	---

FROM OUR BOARD CHAIR	8
----------------------	---

FROM OUR CEO	9
--------------	---



MESSAGE FROM

The Honourable Shannon Phillips

This past year, we have seen more successes for Emissions Reduction Alberta-funded projects, moving us down the path that will cut carbon, cut costs, and help Alberta meet its climate leadership goals.

Emissions Reduction Alberta (ERA) is a key partner in implementing Alberta's Climate Leadership Plan. Their team has worked to identify and support the development of ideas and technologies that reduce greenhouse gas emissions. The investment has resulted in 128 innovative projects that have the potential to significantly reduce greenhouse gas emissions.

ERA is strategically and effectively managing funds provided by the Government of Alberta. They have invested \$375 million into a broad portfolio of technology projects, leveraging funds with industry and trusted partners for a total project value of over \$2.6 billion. This is creating jobs—in the province and across the country—while helping create the lower carbon economy of the future.

ERA launched the Oil Sands Innovation and Industrial Efficiency Challenges, supported by the Climate Change Innovation and Technology Framework. Through these competitive funding opportunities, ERA is fostering ways that cleaner energy can transform the province's future energy needs and bring industry together with innovators to support market-focused innovative solutions for carbon reduction.

Alberta's leadership on climate change means we have set ambitious goals and we intend to achieve them. By supporting innovators to find sustainable solutions, we are building an environmentally and economically competitive province.

When innovation, investment and opportunity come together, we can create something great for the future of our province. ERA provides the support, connections and processes innovators need to put their clean technology ideas in motion.

Sincerely,

Shannon Phillips
Minister of Environment and Parks





Q&A with Kathleen Sendall

BOARD CHAIR

How do Albertans, and Canadians, benefit from ERA's investments?

Simply put, meeting provincial and national climate leadership goals, while supporting the economy, benefits everyone. Minimizing our impact on the environment, while supporting industry, is good for jobs and good for society. Our investments are putting people to work and making a real impact on GHG reductions. It can be difficult to see in our everyday lives, but it will help workers find jobs because we have the most carbon competitive barrel of oil. It's cement products that absorb and store carbon dioxide. Taking action on climate change, supporting the growth of jobs, and investing in innovation, helps build a better future for everyone.

ERA uses key performance metrics to demonstrate its success—which one matters most?

We are here to identify and accelerate innovative solutions that secure Alberta's success in a lower carbon economy. Simply put: we cut carbon and we cut costs. We can't pick between them. Reducing GHG emissions is the core of what we do and we need to attribute everything to that. On the other side of the coin, we look for cost benefits for Albertans: new products, new companies, new jobs. You can see all these metrics on [pages 12 - 13](#) and it's the strongest way to demonstrate success.

How is ERA's funding different from other publicly-funded agencies such as Alberta Innovates or Energy Efficiency Alberta?

One important difference is age and stage of technology. We are focused on pilot, demonstration, and first of a kind scale-up. We also fund projects with clear objectives, milestones, timelines, and deliverables. We don't fund ongoing operations or open-ended programs, like a five-year research initiative. While different, we work together with our trusted partners to maximize our capacity, leverage funding, and make it easier for people to navigate Alberta's innovation system. We are different from our partners for a reason—we don't want to duplicate efforts—we work together for success across the system.

Not all investments deliver the intended results. How does ERA learn from technology that isn't successful?

One technology failure can be another's success. This is part of ERA's return on investment. Our funding recipients are required to produce a final outcomes report, shared publicly for the broader benefit of Alberta. There are always learnings from these projects, both on what works and what doesn't work. We are also finding new ways to talk about real experiences, both successes and challenges. Over 200 people joined us for our first lessons learned event—Brooks Solar. In our survey, all attendees recommended more of these events in the future. It shows a desire for us to host workshops with the intent to accelerate technology adoption by sharing what worked and what didn't.

You have been the Board Chair for four years. What are you most proud of?

What stands out is the joint call with SDTC. It paved the way for our Partnership Intake Program and helped us think through how we can do better across the innovation system. It was the first time we worked together to allow innovators access to funding through a single application, instead of two separate and unique processes. This coordinated, co-funded approach is a great example of how Alberta and Canada are leveraging funds to attract new investment to Alberta. It also allowed entrepreneurs and innovators more time to focus on developing ideas and technologies, rather than filling out applications. SDTC has gone on to use it as a stepping stone to work with other provincial organizations. That's a big win. It shows strong leadership from ERA in the system.

Q&A with Steve MacDonald

CEO



What was the biggest highlight from this year?

If I had to pick just one thing, I would say our Oil Sands Innovation Challenge was the biggest highlight. These technologies have the potential to significantly reduce the footprint of oil sands production in Alberta. Also, we challenged applicants to bring forward projects that would cut carbon and cut costs. This was a breakthrough and the major oil sands players involved in every project will deliver real action. Imagine no more tailings ponds or the elimination of steam in the extraction process. These are game-changers. You can read about all the projects on [pages 26 - 28](#).

What are the biggest barriers to technology acceleration in Alberta right now? How is ERA navigating them?

Canada and Alberta have historically been good at coming up with innovative ideas, yet we have struggled to commercialize new technologies as quickly as other jurisdictions. This is not necessarily because of a shortage of funds in the early innovation stage. The ability to attract smaller dollars for scientific discovery and proof of concept isn't the issue. The need for large capital funding sources to scale-up, demonstrate, and deploy projects remains a major barrier in Alberta and across Canada. ERA is providing funds that help mitigate the technology risk associated with scale-up. Our model also requires industry match ERA's investment, demonstrating market pull. We also look for opportunities to further leverage funding by connecting projects with our trusted partners. You can read more about these partnerships on [pages 44 - 46](#).

How has Alberta's innovation ecosystem changed in the last year? 10 years?

It has come a long way. ERA has been in operation since 2009. Across the system we are working as trusted partners. There was a time when it felt like innovation organizations were at best working in isolation and at worst competing with one another. Industry and governments recognize that we must work together to be even more nimble and effective going forward. We need to continue to work together to identify the right priorities. And, we need to pick the most promising technologies—this is what ERA's process is designed to do. We can't sprinkle money across

every good idea and expect to be successful. We need to prioritize technology gaps as a system. This is how Alberta will lead the way to a lower carbon future.

How do you know ERA investments are working?

ERA has funded 128 projects and leveraged money so that our \$375 million generated over \$2.6 billion in total investment. Job creation is so important to the province right now, and our modelling suggests that this investment will generate 12,000 person-years in jobs by 2023. In terms of GHG reductions, we plan to reduce more than nine million cumulative tonnes by 2020—and by 2030 we are estimating that number will grow to more than 28 million tonnes. It's a good start, but the number of projects and the amount invested isn't the measure of success. The real demonstration of success won't come until later—when the projects we fund are commercialized and deployed in the market. That's the low carbon future.

How do you know you are delivering what Albertans want and need?

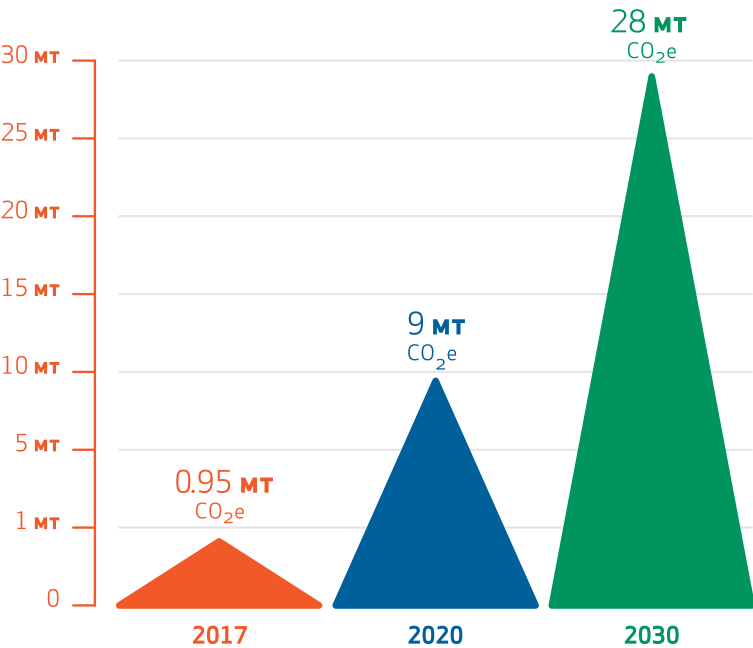
Talking to innovators, project proponents, and others in the innovation system offers great insight. A large part of our team's role is listening to better understand challenges. In November 2017, we conducted a formal research project to test the level of awareness, familiarity, and support for ERA and its mandate. This research gave us a better understanding of public and stakeholder opinions and identified opportunities for improvement. One statistic that is important to me: two thirds of our stakeholders would recommend others apply for funding through ERA. This is known as a net promotor score, and it is believed to be the truest measure of customer satisfaction. This helps us validate that the call for proposals process is working and identify where there is room for improvement.

ERA



Key Performance Metrics

ENVIRONMENT



GHG Reductions

- More than 950,000 tonnes of CO₂e in 2017
- More than 9 million tonnes of CO₂e by 2020
- More than 28 million tonnes of CO₂e by 2030

*Please note: GHG reductions are reported on a calendar year basis, not fiscal year.

ECONOMY



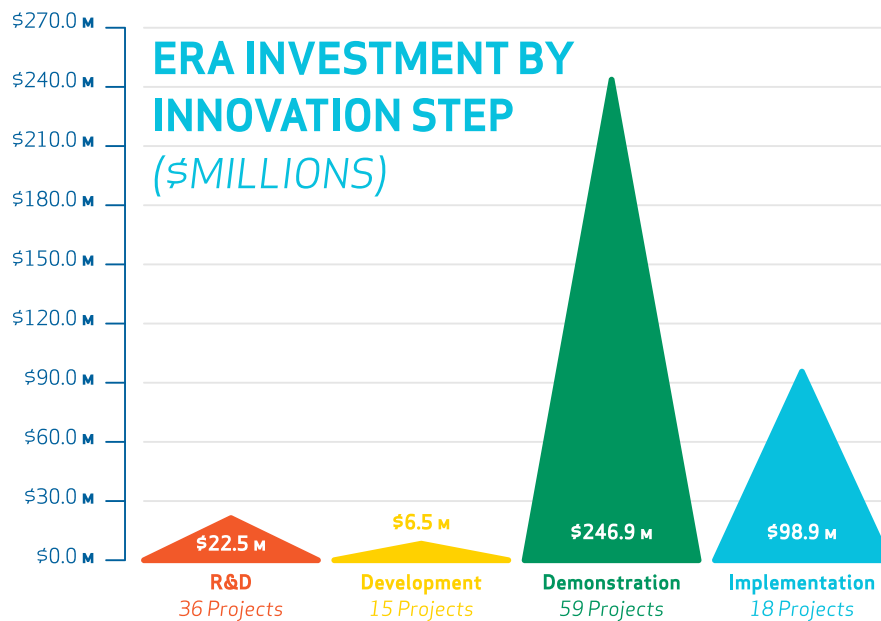
For every ERA dollar we commit to advancing new technologies, another **\$6** has been invested by funding partners.

*Please note: economic impact is reported on a calendar year basis, not fiscal year.



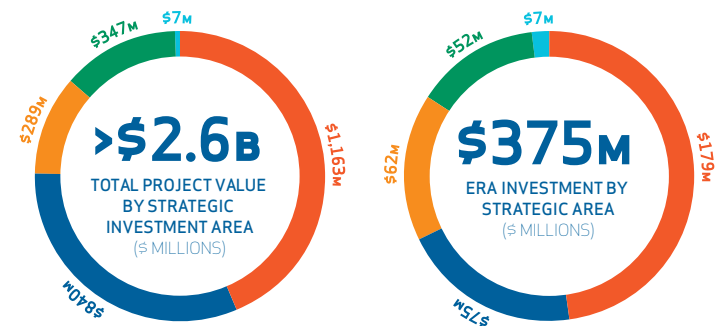
*A person-year is equal to one-year of employment for one individual.

TECHNOLOGY



128 Projects

- Reduced GHG footprint of fossil fuel supply (48 projects)
- Low-emitting electricity supply (12 projects)
- Biological resource optimization (36 projects)
- Industrial process efficiency (29 projects)
- Adaptation (3 projects)



COMMUNITY



6
Trusted Partners signed;
10 IN TOTAL



26 EVENTS, WORKSHOPS OR SPEAKING ENGAGEMENTS ATTENDED

AUDIENCE OF OVER **9,000**



200+ Articles

online, print

Potential reach of

644 Million

Focused strategic priorities

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

To achieve our vision and mandate, ERA will:

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.

A focus on these priorities will allow us to deliver both environmental and economic benefits that position Alberta as a leader in a lower carbon world. These are the priorities we will report against in this 2017/18 Annual Report.

Alberta's Climate and Innovation Policy context

Our investment portfolio focuses on projects aligned with the desired outcomes of the Alberta Climate Leadership Plan. Our actions, along with those in the province's broader innovation system, are also guided by two important frameworks: The Climate Change Innovation and Technology Framework (CCITF) and the Alberta Research and Innovation Framework (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 our path forward clear.

Highlights from the year

We partner to accelerate technologies that deliver on the commitments set out in our business plan. Some standout moments from 2017/18 include:

Over \$70 million announced for nine oil sands projects

Nine Alberta oil sands technologies received more than \$70 million through our Oil Sands Innovation Challenge. These technologies are estimated to help oil sands companies cut operating costs and deliver potential GHG emissions reductions of over 4 million tonnes of annual CO₂e in Alberta by 2030. Please note, since the announcement, one project has withdrawn. [Read more on pages 26 - 28.](#)

Brooks Solar Lessons Learned Workshop shares project insights

Over 200 people attended our half-day, free Lessons Learned event on March 9, 2018 at the Metropolitan Conference Centre in Calgary. The workshop showcased our role in accelerating the Brooks, Alberta solar project. Project owner Elemental Energy, financier National Bank of Canada, the County of Newell, and representatives from the Alberta Electric System Operator (AESO) and Fortis shared key learnings from the first utility-scale solar project in western Canada. [Read more on pages 48 - 49.](#)

\$35 million Industrial Efficiency Challenge launches

Large industrial emitters with innovative ideas to reduce GHG emissions and cut costs across industrial sectors were invited to apply to our \$35 million Industrial Efficiency Challenge launched March 28, 2018. We reviewed 93 submissions and invited 19 applicants to submit Full Project Proposals (FPP). [Read more on pages 24 - 25.](#)

Securing partnerships with like-minded innovation investors

Partnerships are critical to delivering a complete solutions approach. They help us convene the right resources, and bridge the gaps on technological,

business development, financial resources, and capacity challenges. In 2017/18, we secured the following trusted partner agreements:

- ▶ **Natural Resources Canada (NRCan)**
- ▶ **Evok Innovations**
- ▶ **University of Alberta**
- ▶ **University of Calgary**
- ▶ **Natural Gas Innovation Fund (NGIF)**
- ▶ **Northern Alberta Institute of Technology (NAIT).**

Inaugural SPARK conference sells out

More than 560 innovation and business leaders converged in Edmonton, November 6-8, 2017 to attend SPARK. The conference, co-hosted with Alberta Innovates, featured more than 80 thought leaders. It brought cleantech researchers and innovators together with representatives from the business community, government, and the innovation system. [Read more on pages 44 - 45.](#)

Evolving ERA's Technology Roadmap with Energy Futures Lab Fellows

Our Technology Roadmap (TRM) guides our investment decisions and informs our portfolio mix. Keeping it current is critically important to our success. In January 2018, we engaged the Energy Futures Lab (EFL) and its Fellowship to review the document. EFL analyzed our four investment areas of focus and provided a summary of ideas and recommendations to better define technology pathways and success. Key to this review was a “backcasting from the future” perspective central to the EFL’s work. Backcasting starts with the end in mind, seeks to outline conditions for a successful future, and then uses this vision as the starting point for planning. We used this advice and insight to update our TRM. [Read more on page 34.](#)

Our team

We support our Board by providing the latest intelligence, research, and expert advice to facilitate decision-making.



Steve MacDonald
CEO



Jennifer Cleall
Legal



Heather Stephens
Finance



Elizabeth Shirt
Executive Director, Policy And Strategy



Michelle Gurney
Communications



Mark Summers
Executive Director,
Technology And Innovation



Amanda Amyotte
Executive Support





Our Board of Directors

These technology and innovation insiders offer governance expertise and strategic direction to ERA. With diverse backgrounds that include industry, government, academia, and the not-for-profit sector, they provide thoughtful leadership with a focus on delivering results.



Kathleen Sendall, C.M., Chair
*Corporate Director; Board Member, CGG S.A.;
Board Member Enmax Energy Corporation*



Sara Hastings-Simon, PHD
*Associate Regional Director for Alberta,
Pembina Institute*



Brenda Kenny, PHD, Vice-Chair
*Corporate Director; Board Chair,
Alberta Innovates; Member
Council, SDTC; Board Member,
Canada West Foundation*



Sandra Locke
*Assistant Deputy Minister of the Implementation and
Regulatory Division, Alberta Climate Change Office*



**Robert Mansell, PHD, Secretary-
Treasurer**
*Academic Director, School of Public Policy,
University of Calgary*



Clive Mather
*Chairman, Iogen Corporation; Chairman,
Shell Pension Funds, U.K.*



Céline Bak
*Senior fellow,
Centre for International Governance Innovation*



Patricia Mohr
*Former Vice-President, Economics & Commodity
Market Specialist, Scotiabank*



Joseph Doucet, PHD
*Dean,
University of Alberta School of Business*



Jim Carter
*Former President and Chief Operating
Officer, Syncrude*

Governance

ERA collaborates with and is accountable to the Government of Alberta. We are a Delegated Administrative Organization (DAO). This structure allows ERA to:

- ▶ Carry funds from one budget year to the next
- ▶ Ensure multi-year projects are possible
- ▶ Have its own financial statements
- ▶ Use funds outside of the Government budget process.

A commitment to good governance helps us realize operational efficiency and effectiveness. Read more of our 2017/18 governance highlights below.

Recruiting for our Board of Directors

In 2017, the Board said good-bye to long-time director Jim Carter, who resigned after eight years of service. The Board also welcomed three new members: Céline Bak, Sara Hastings-Simon, and Clive Mather. A transparent and extensive search was conducted with support from government stakeholders and a third-party recruitment firm.

In spring of 2018, we began a rigorous recruitment process to select the next Chair of the ERA Board of Directors. Dave Collyer has been named successor to Kathleen Sendall effective as of October 1, 2018. Ms. Sendall has led the ERA Board since December 2014. In 2017/18, she continued to drive a strategic shift in organizational governance leading to increased transparency, sustainable funding, operational cost efficiencies, and refinements to core strategies.

Board Assessment completed

Each year, our Board completes a detailed self-assessment that addresses areas such as leadership, strategic direction, and compliance with terms of reference and ethical and legislative standards. The Board uses the assessment to help chart its path forward. For 2017/18, effectiveness ratings were high overall, with mean scores between 4.5 and 5 on a 5-point scale.

Securing sustainable and predictable funding

The Government of Alberta committed new funding to support the delivery of our 2018/21 Business Plan. This includes \$80 million in core funding announced in December 2017, and a further \$84.5 million over three years for additional initiatives that fit within the focus of our Technology Roadmap.

Collecting jobs information through our funding process

In addition to environmental metrics, we improved our collection and reporting on employment outcomes. We are gathering more information from individual applicants about the estimated job creation from proposed projects. We have also started highlighting our contribution to Alberta and Canada's GDP. We work directly with the Department of Economic Development and Trade (EDT) to estimate the broader economic and job creation impact of our funded projects and related investment.

Collaborating on CCITF program design and outcomes

The Government of Alberta announced funding for the Climate Change Innovation And Technology Framework (CCITF) in December 2017. The framework serves as the overarching guide for the investment of funds for innovation and clean technology from the pricing of carbon emissions. EDT, ERA, and Alberta Innovates are working together to deliver a suite of programs under the framework. These programs will use ERA's trusted GHG methodology for funding criteria and evaluation.

ERA



STRATEGIC PRIORITY: ACCELERATE TECHNOLOGY

**Q&A WITH MARK SUMMERS, EXECUTIVE DIRECTOR,
TECHNOLOGY AND INNOVATION**

22

COMMITTED TO CLEAN TECHNOLOGY INVESTMENTS

24

**MOVING IDEAS TO IMPLEMENTATION ACROSS
THE INNOVATION ECOSYSTEM**

30

REDUCING EMISSIONS AND DRIVING ECONOMIC GROWTH

34

**SHARING INSIGHTS THROUGH SPEAKING SESSIONS
AND TRADE SHOWS**

36



Q&A with Mark Summers

EXECUTIVE DIRECTOR, TECHNOLOGY AND INNOVATION

You have a complex and comprehensive portfolio—what does ERA invest in and why?

We know good ideas can come from anywhere. So, we can and do fund a broad range of innovators, from large industries to small and medium-sized enterprises (SMEs), research organizations, and municipalities. The portfolio represents a range of technologies, and what unifies them is that they are all great ideas that can help Alberta be successful in a low carbon world. That means delivering both environmental and economic benefits. These innovators are Albertans, Canadians, and even some from outside the country, but all projects funded by ERA need to demonstrate a clear and verifiable GHG benefit for Alberta.

Any projects stand out based on their potential impact?

Our portfolio represents opportunities across multiple timescales. Some have immediate impacts in Alberta by creating jobs and reducing emissions before the project is even finished. Those projects are exciting because they are tangible and the results are quantifiable now. We are also looking at some truly transformative opportunities that can change the face of the industry in which they are being applied. One example is oil sands recovery technology that uses light hydrocarbons to mobilize the bitumen. This has the potential to reduce emissions from oil sands recovery by more than 50 per cent. Since the oil sands industry is the largest and fastest growing source of GHGs in Alberta, this has the potential to make a significant impact in the province. A third group of exciting technologies is those that don't address an immediate industry need, but rather create new markets, new economic activity, and new jobs through sustainable technology. They can grow the economy without growing emissions.

This year, you hosted several workshops to better define funding challenges. How was this helpful?

It's tremendously helpful to hear directly from those we fund and those who have applied for funding: idea creators, innovators, existing operators who have emissions they want to reduce without hurting productivity, and those creating new opportunities for the cleaner economy of the future. They help us shape future funding initiatives and align their outcomes with the outcomes we desire. We can only be successful if we design our

funding challenges to align with both the market needs and the innovations that can take advantage of these opportunities.

Can you speak to the importance of expert peer review in supporting funding decisions?

It is critically important for us to invest in opportunities that have the conditions for success. It's about complete solutions; we want to fund technologies within an investment, regulatory, and policy environment where ideas can thrive. It's why we work so closely with partners like the Alberta Energy Regulator and policy makers with the Government of Alberta. Before the launch of any ERA Challenge, we convene industry, government, innovators, and a variety of stakeholders to make sure we are focused on the solutions that deliver the greatest outcomes. Independent experts and evaluators play a vital role in the selection of projects. They have backgrounds in business, financing, science, engineering, and GHG quantification. It's important to have independent reviewers with subject matter knowledge to assess whether these are the right opportunities. We also assign advisors to help applicants during the process. This helps to ensure that the questions from the expert peer review team are fully addressed.

How will ERA maintain momentum in 2018/19?

Our job, in partnership with those we fund, is to push the status quo. When you do that, there are always new boundaries to explore. We build on the success and learnings from our investments and continue to advance what we once thought not possible. We always operate in what is known as the "adjacent possible"—the edge of our present and future state. We accelerate opportunities that have the capacity to thrive in the current environment. The most transformative technologies are built on the successes and failures of the past. It's crucial that we continue to push boundaries and create the future we want for Alberta.



Committed to clean technology investments

Our investments help industry and communities adapt to, and benefit from, rapid technological change. They position Alberta as a jurisdiction where clean technology can succeed. We invest in a range of technologies. In 2017/18, we delivered funding commitments to eight new projects as part of our Oil Sands Innovation Challenge. These projects, ranging from enhanced bitumen recovery to partial upgrading technology, are expected to reduce emissions by more than four million tonnes per year by 2030. We also launched the \$35 million Industrial Efficiency Challenge and worked behind the scenes to prepare for our latest funding opportunity, the BEST Challenge—aimed at biotechnology, electricity, and sustainable transportation technology areas.

INDUSTRIAL EFFICIENCY CHALLENGE LAUNCHED

We launched the \$35 million Industrial Efficiency Challenge in March 2018 to find the best opportunities for industrial efficiency at Alberta's large-emitting facilities. Technologies submitted showed potential to reduce GHG emissions and improve cost competitiveness across Alberta's industrial sectors. Since the deadline, we reviewed 93 submissions and invited 19 applicants to submit Full Project Proposals (FPP).

The funding opportunity requires that projects are sited at facilities that are subject to the Carbon Competitiveness Incentive Regulation (CCIR) or opt in to the CCIR. Many Large Final Emitter (LFE) facilities in Alberta compete in Emissions-Intensive Trade-Exposed sectors. Reducing the carbon footprint of these industries can help them remain competitive as the world moves to an increasingly carbon-constrained future.

The Industrial Efficiency Challenge is part of a comprehensive suite of programming that supports Alberta's Climate Leadership Plan, the goals of the CCITF, and the CCIR.

Stakeholder learnings helped shape the Challenge

To inform the Industrial Efficiency Challenge, we hosted stakeholder meetings and two workshops to seek input. These initiatives involved trusted partners who could further leverage funding, innovators, post-secondary institutions and industry members with potential to submit proposals. Participants reviewed our draft project scope, talked about potential technology opportunities that could result, and how the scope could evolve to attract projects with the most impact. We also sought input on our own call for proposals process and how it can be improved to benefit project proponents. As a result, we reduced the application from 10 to 8 pages, and made certain applicants had eight weeks to submit applications following the challenge launch.

WEBINAR INFORMS POTENTIAL PROPONENTS

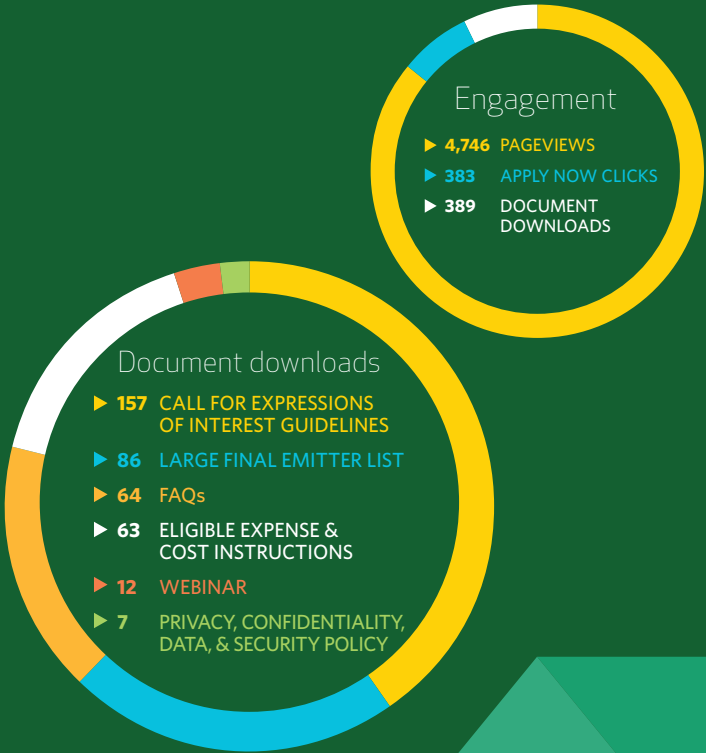
ERA hosted an educational webinar in April. More than 200 people listened in to learn more about how to put their best application forward for the Industrial Efficiency Challenge.





Checking in on coverage and clicks

Raising awareness of our calls for proposals helps us ensure we are attracting the best possible applications. The Industrial Efficiency Challenge announcement was covered by *CBC*, *CBC Radio Canada*, *CTV Calgary* and *Global Calgary*. There was a total of 43 tweets on Twitter referencing the announcement, generating more than 10,000 impressions. We also promoted the announcement via LinkedIn. In addition to traditional and social media traffic, we constantly monitor our website as part of our communications campaigns. The Industrial Efficiency Challenge campaign secured the following:



NINE OIL SANDS INNOVATION CHALLENGE PROJECTS ANNOUNCED

Our \$70 million Oil Sands Innovation Challenge closed for submissions on September 7, 2017. In May 2018, we announced nine new projects valued at over \$720 million. The funding call focused on technologies that reduce GHG emissions and increase the global competitiveness of Alberta's oil sands industry. We reviewed 47 submissions and invited 10 applicants to submit Full Project Proposals before selecting nine of the projects. Since the announcement, one project has withdrawn. We are now providing eight projects with more than \$60 million in support. The projects have a combined total value estimated at over \$689 million. By 2030, these projects have the potential to deliver up to a 50 per cent reduction in operating costs and reductions of 4.1 million tonnes of CO₂e annually, fundamentally changing the footprint of Alberta's oil sands.

Projects are:

► **MEG Energy eMVAPEX Pilot, Phase 3**

ERA contribution: \$10 million

MEG Energy Corp. is an Alberta company focused on sustainable in situ oil sands development and production in the southern Athabasca oil sands region of Alberta. Steam generation is the main contributor to GHG emissions, water consumption, and the capital and operating costs of bitumen production. Enhanced Modified VAPOur Extraction (eMVAPEX) involves the application of infill wells and the injection of a condensable gas instead of steam after initial steam-assisted gravity drainage (SAGD) operation. The eMVAPEX process can reduce the company's steam-oil-ratio (SOR), freeing up steam to apply to new wells and increase overall production. The overall GHG emission intensity could be reduced by as much as 43 per cent. The overall recovery from the reservoir is also expected to improve. The company has implemented the technology on three well pairs and associated infill wells with encouraging results. MEG's 2018 capital program allows for the conversion to eMVAPEX of seven additional well pairs and associated infills, and the construction of a propane recycling facility to test the commerciality and scalability of the technology.

► **Suncor Energy Inc.: High Temperature Membranes for SAGD Produced Water Treatment**

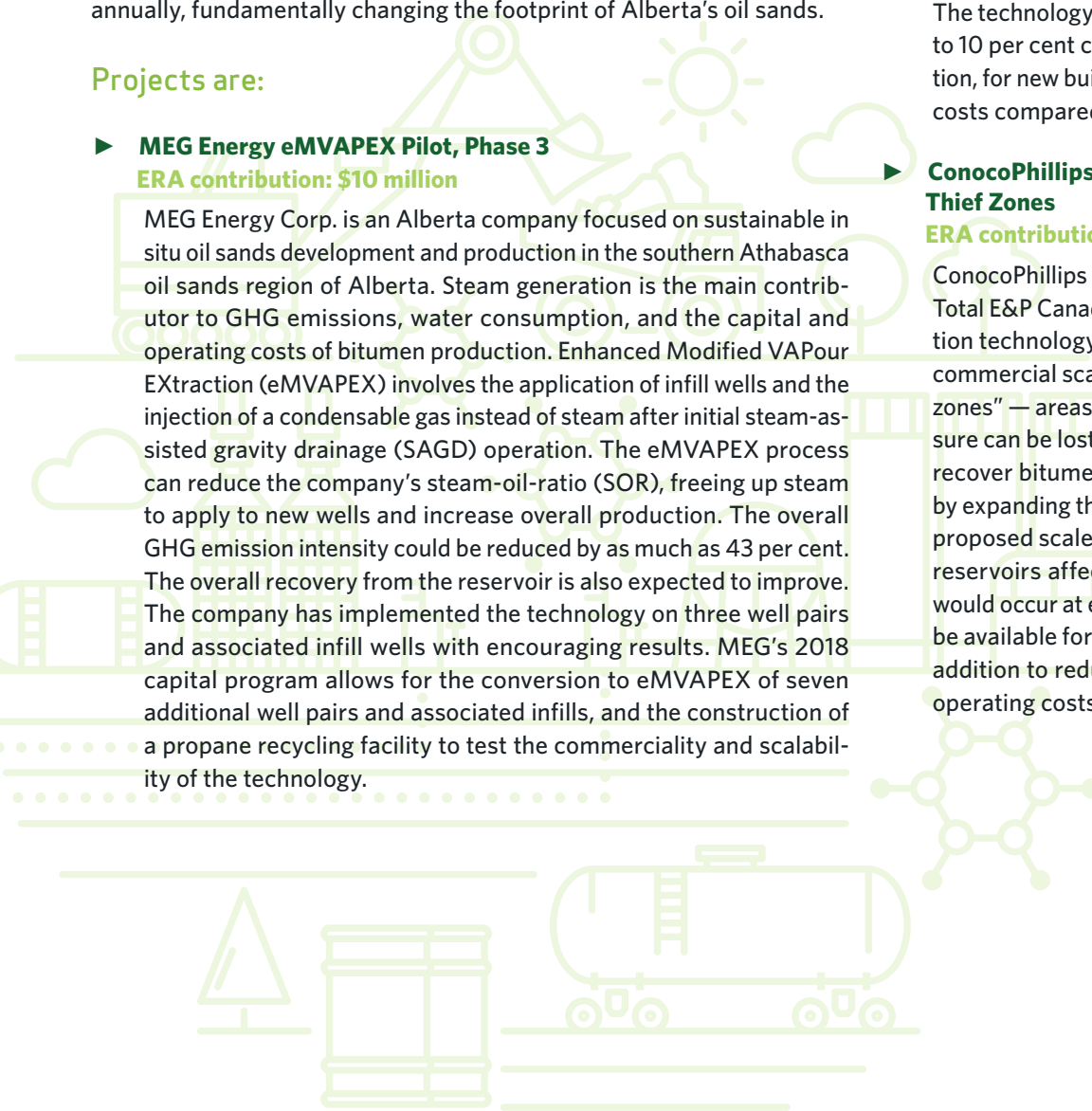
ERA contribution: \$2.5 million

Suncor is partnering with Devon Energy and Suez (formerly GE Water) to demonstrate High Temperature Reverse Osmosis (HTRO) membranes for SAGD water treatment. The project will validate the technology for application in high-temperature SAGD conditions. If successful, the membranes could eliminate the need to reduce the temperature and pressure of produced water prior to water treatment. A high temperature membrane plant could reduce the energy required and infrastructure for the SAGD water treatment process. The technology has the potential to reduce GHG emissions from five to 10 per cent compared to a typical SAGD baseline facility. In addition, for new builds, the technology has the potential to reduce capital costs compared to conventional SAGD water treatment facilities.

► **ConocoPhillips Canada: Non-Condensable Gas Co-Injection for Thief Zones**

ERA contribution: \$2.5 million

ConocoPhillips Canada, as operator of its Surmont joint venture with Total E&P Canada, will deploy its Non-Condensable Gas (NCG) injection technology at 12 SAGD well pairs to validate the technology at commercial scale. NCG injection has the potential to mitigate "thief zones" — areas above or below the oil zones where energy and pressure can be lost, resulting in a need for more steam to be injected to recover bitumen. The project builds on past work in NCG injection by expanding the application to the full well life. NCG injection at the proposed scale could reduce GHG emissions by up to 15 per cent in reservoirs affected by thief zones. Initial commercial deployment would occur at existing and new Surmont sites. The technology could be available for other SAGD operators to deploy as early as 2021. In addition to reducing GHG emissions, the technology could reduce operating costs for SAGD facilities by up to 20 per cent.



► **Heavy Oil Solutions and Cenovus Energy Inc.:
Partial Upgrader with Integrated Water Treatment**

ERA contribution: \$10 million

Heavy Oil Solutions and Cenovus plan to test a process to upgrade bitumen to lighter oil at Cenovus's Christina Lake oil sands project, potentially eliminating the need to blend the bitumen with diluent to make it flow through a pipeline. The process has potential to reduce costs, shrink Cenovus's environmental footprint, and free up much-needed pipeline capacity. Through a single-step operation, using water that is produced alongside the oil, the process is designed to return crude oil that is effectively pipeline ready and water that can be reused in the crude oil production cycle without extensive treatment. Originally developed for the remediation of nuclear waste, the technology holds potential for simplifying and integrating all surface operations at the well pad.

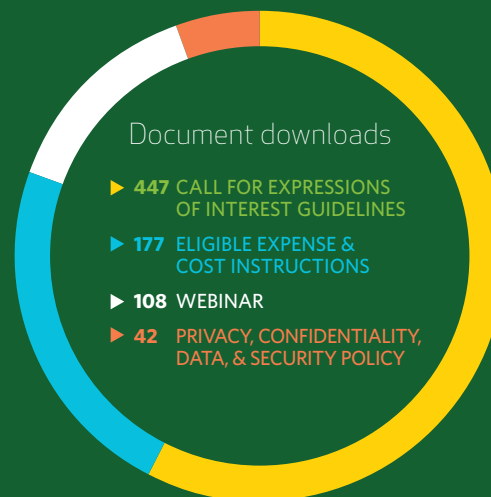
► **Enlighten Innovations Inc. (Formerly Field Upgrading): CLEANSEAS™
Demonstration Project**

ERA contribution: \$10 million

Enlighten Innovations Inc. will design and construct a demonstration facility for its DSU® technology. DSU removes sulphur and partially upgrades heavy oil, including Alberta bitumen into low-sulfur marine fuel. Low-sulfur marine fuel is an alternate, value-added market that is growing in response to new marine transport regulations. The CLEANSEAS project is a commercial scale of the technology and signifies a critical step toward full commercial rollout. Commercial implementation of the technology will involve construction of modules at the same scale as the demonstration plant. The modules can be installed close to bitumen production facilities or refining facilities. Enlighten Innovations estimates that the DSU technology reduces GHG emissions on a life-cycle basis by up to 40 per cent compared to alternative pathways for production of marine fuel.

Amplifying our announcement

We joined Minister Shannon Phillips to announce funding for these Oil Sands Innovation Challenge projects on May 8. Traditional media coverage included the *Fort Saskatchewan Record*, *Fort McMurray Today*, *Global News*, *Daily Oil Bulletin*, *Lloydminster Source*, *CBC*, *660 News*, *Broadcast News*, *Canadian Press* and *Country 105*. The announcement also generated 219 mentions and nearly one million impressions on Twitter alone. We launched a teaser campaign, complete with video stories, to complement the announcement. Throughout the Challenge, our campaign also drove significant traffic to our website.



► **Cenovus Energy Inc.: Multi-Pad Pilot of a Solvent-Aided Process**

ERA contribution: \$10 million

Solvent use is one of the key technologies Cenovus is working on to improve the efficiency of its in situ oil sands recovery and reduce its environmental impact, especially in GHG emissions. Solvent-aided process (SAP) involves adding a solvent such as propane to the steam that's injected into the reservoir in SAGD. Cenovus estimates that on a field-basis, SAP could reduce emissions intensity by about one third compared to SAGD. Cenovus is planning its SAP operational demonstration project on multiple well pads at its Foster Creek oil sands project.

► **Canadian Natural Resources Limited: In-Pit Extraction Process**

ERA contribution: \$5.6 million

Canadian Natural Resources Limited (CNRL) will demonstrate a field pilot of its In-Pit Extraction Process (IPEP) technology, an alternative to conventional oil sands mining and ore processing. The IPEP technology involves a relocatable, modular extraction plant that can be moved as the mine face advances. Ore processing and bitumen separation occurs adjacent to mining operations, significantly reducing material transportation. In addition to reducing GHG emissions, IPEP produces stackable tailings within the mine pit, greatly reducing the volume of fluid tailings and ultimately accelerating reclamation of oil sands mines. CNRL estimates that IPEP technology could reduce GHG emissions by up to 40 per cent in bitumen production compared to typical oil sands surface mining and extraction processes. The IPEP system would also enable expansion of mining operations without constructing new central ore processing facilities. CNRL has committed to make this technology available to oil sands mining companies through COSIA for more rapid industry-wide adoption. In addition to reducing GHG emissions and other environmental benefits, it is estimated that the technology will reduce production costs by roughly \$2 per barrel and substantially reduce long-term tailings management costs and liabilities.

► **Imperial: Enhanced Bitumen Recovery Technology Pilot**

ERA contribution: \$10 million

Imperial is advancing a field trial of its Enhanced Bitumen Recovery Technology (EBRT) to validate the method and prepare it for commercial use. The process uses a recovery solution to dilute and mobilize bitumen in the reservoir, reducing the amount of steam by as much as 90 per cent compared to current methods. Alternatives to steam are key to increasing energy efficiency and reducing water use from oil sands operations. Based on Imperial's research, it is expected the technology could reduce GHG emissions intensity from in situ oil sands extraction facilities by approximately 60 per cent compared to conventional SAGD production methods. EBRT can be applied at both existing and new build sites in place of conventional in situ facilities. The technology operates at lower pressures and may enable recovery from reservoirs not previously considered viable. It is also expected to reduce initial capital and operating costs by approximately 50 per cent.

BEST CHALLENGE:

Biotechnology, Electricity, and Sustainable Transportation

ERA's BEST Challenge is a good example of our efforts to take an integrated approach to encourage greater collaboration and technology disruption across sectors and focus areas. In 2018, we are challenging innovators in biotechnology, electricity, and sustainable transportation to bring their best technology ideas forward. To prepare for this announcement, we sought industry input to define the scope of our latest funding opportunity. What we heard was, working within and across these areas will increase the opportunity to break down barriers and accelerate the most promising GHG-reducing solutions. We are making up to \$70 million available. This will be leveraged with industry funding to generate at least \$140 million in new investments.

PARTNERSHIP INTAKE PROGRAM EVOLUTION

Prior to 2017, ERA could only consider funding projects submitted through our Call for Proposals process. In response to innovator feedback and our own learnings, we initiated the Partnership Intake Program to allow greater flexibility around our funding process. This program is an opportunity for us to fund innovative GHG-reducing projects that are brought forward by our trusted funding partners. By working together, we can maximize our capacity, leverage funding, and make it easier for innovators to navigate the innovation ecosystem.

We can now consider promising technologies for funding outside of our traditional call for proposal process, while leveraging our partnerships with organizations such as Alberta Innovates, NRCan, and SDTC. Tech scouting activities conducted in 2017/18 identified projects that will be brought to the Board for consideration in the 2018/19 fiscal year.



Moving ideas to implementation across the innovation ecosystem

Getting technologies from idea generation to pilot, scale-up, and ultimately deployed in the market requires strong linkages within the innovation system. This awareness makes sure nothing falls through the cracks in transition. To support diversification, education, training, climate change action, and job creation, we work in close alignment with the ever-evolving innovation system and the complementary strategies developed by government departments.

Our guiding document, ERA's Technology Roadmap, serves as a catalyst for broadening partnerships with organizations like SDTC and NRCan, while bringing together diverse stakeholders to directly promote and authenticate Alberta as a global leader on mitigating greenhouse gas emissions.

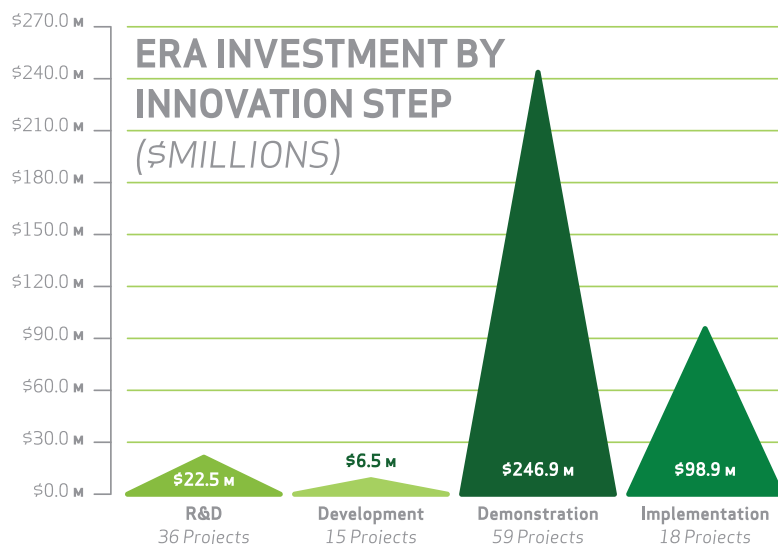
Technology Readiness Levels (TRL) are one way to measure how projects are advancing with the help of our funding. Investment across multiple timescales is required to be successful in addressing the climate change challenge. Under the CCITF, we are responsible for investment in clean technology demonstration and scale-up. Other delivery agents, such as academia and Alberta Innovates, are responsible for investments in earlier stage technologies.





Investments by innovation stage

Our TRL progression tracking is a key metric for all projects moving forward. Applicants are required to self-assess the TRL level of their technology and the expected advancement over the course of the project. In 2018/19, we will take further steps to establish more robust performance metrics that also address factors such as success rate, economic impact, and progress toward reducing technology costs overall. We are working with Alberta Innovates' Performance Management and Evaluation team to develop an assessment of how technologies within our portfolio have progressed along the innovation spectrum. This work will be important to inform how we are helping to accelerate technologies, as well as better understand the broader system challenges faced by our projects' proponents.



Here are just a few examples of how ERA funded projects progressed along the TRL scale:

MEG Energy eMVAPEX:

Propane injection pilot propels towards commercialization

Oil Sands Innovation Challenge Funding Recipient

When it first came into the innovation ecosystem in 2016, supported by Alberta Innovates, MEG Energy's eMVAPEX technology balanced between applied research and development ➡ **TRL4** and Technology Development ➡ **TRL5**.

The propane-based in situ oil sands technology aims to dramatically reduce water use and increase efficiency, lowering costs and GHG emissions. Results to date have demonstrated the effectiveness of the technology. MEG has been operating an eMVAPEX pilot at its Christina Lake SAGD project since November 2016. The project has grown from a single well pilot project in Phase one (2016) to three wells in Phase two (2017).

Currently, with additional funding provided by ERA's Oil Sands Innovation Challenge, the propane-based in situ technology is in the Technology Demonstration stage ➡ **TRL 7-8**. The end goal is to see the project reach scale at ➡ **TRL 9**, Commercial Implementation and Technology Adoption.



Construction is now underway for Phase three (2018) that extends the technology to a full pad scale demonstration to confirm success in preparation for commercial implementation. Operations are expected to begin in Fall of 2018. The project is a great example of co-funding opportunities provided by ERA.




Viresco:

Large-scale demonstration aims to minimize cattle-based methane emissions

Methane Challenge Funding Recipient

For nearly 10 years, the global health and nutrition company DSM has been conducting scientific discovery  **TRL 1-2** of a compound with the potential to reduce methane emissions from cattle. In its smaller trials  **TRL 3-4**, DSM learned that its 3NLP product has the potential to reduce cattle-based methane emissions by more than 30 per cent.

The project was recognized for having positive implications for the province. According to the 2016 Census of Agriculture for Alberta, 69 per cent of Canada's fed cattle production happens in Alberta. The province is also home to 4.9 million beef cattle—41.6 per cent of the national herd.

Looking to demonstrate this feed ingredient at a larger scale  **TRL 5+**, DSM partnered with Viresco Solutions, a Canadian-based agriculture sustainability consulting company, and a consortium of Alberta agricultural partners. Through ERA's Methane Challenge, the \$2.9 million project is being funded in part by ERA with \$1.46 million. The project was officially approved in December 2017 and research is ongoing.

The compound is being introduced to reduce methane produced by each animal, enabling substantial reductions in emissions from Alberta's beef and dairy industries. Cattle are fed corn and barley along with different dosages of 3NLP to adjust the digestive system. Research started with younger, lighter cattle and has progressed throughout 2018 to more mature, larger cattle. Test feedlots are separated from regular feeding sites and lasers are used to measure emissions from each for comparison. Animal performance, health and carcass quality is being assessed to see how the product affects eating habits. Research results are expected in March 2019 with an aim of 30 to 40 per cent emissions reduction.



Mangrove Water Technologies:

Technology for conversion of carbon dioxide and saline wastewater to oil and gas field chemicals and re-useable water

Grand Challenge Funding Recipient

Technology spinning out of a university lab in British Columbia has led to a new company advancing a field pilot project in Alberta. Positive technical results produced at each milestone of the project have led to opportunities for preliminary lab work to progress to prototype and towards demonstration. Mangrove Water Technologies is a spin-off company from the Chemical Engineering Department at the University of British Columbia. The technology was developed in the Wilkinson Research Group during Round One of the ERA Grand Challenge  **TRL 1-2**.

Mangrove's innovation recovers extractable value for on-site utilization by converting carbon dioxide and saline wastewater produced during oil and gas operations to re-usable water and oil field chemicals. The technology offers a "bolt-on" solution that would allow the oil and gas sector to reduce operational costs in addition to reducing their water consumption, wastewater generation and carbon footprint.

For Round Two of the Grand Challenge, Mangrove has partnered with NORAM Engineering and Constructors, Questor Technology Inc., and the Saskatchewan Research Council to demonstrate a field pilot  **TRL 5-6** and  **TRL 7-8** of the technology coupled with a waste-gas to power system.

They are simultaneously working with commercialization services, including Creative Destruction Lab to build their customer base and scale-up their business with the support of mentors and investors. In addition to ERA, the technology has been supported by funding through Western Economic Diversification, Natural Sciences and Engineering Research Council of Canada and the Pacific Institute for Climate Solutions.

-  Scientific Discovery
-  Applied Research and Development
-  Technology Development
-  Technology Demonstration
-  Commercial Implementation and Technology Adoption

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. 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 over the long-term.

Updating our Technology Roadmap

To make certain our investments remain relevant and impactful, ERA developed a Technology Roadmap (TRM) in 2016. This guiding document supports our investment decisions and informs our portfolio mix.

The TRM is a living document and is part of a continuous process designed to support ERA as a flexible and nimble organization that can adjust to new information, challenges, and opportunities.

In January 2018, we updated the TRM with input from the EFL Fellowship. Central to their advice was to create a more specific and compelling version of Alberta's lower carbon world. Using the EFL's expertise at visioning and backcasting provides a clearer description of what we are trying to achieve. This enhancement helps paint a picture of the unique contributions Alberta can make in a low-carbon emissions future and further highlights options for the technological pathways to get there.



1. Begin with the end in mind.
2. Look back from the future to the present.
3. Move step by step toward the future.



Sharing insights through speaking sessions and trade shows

In 2017/18, we engaged with stakeholders and participated in events that help us identify and accelerate GHG-reducing solutions. ERA participated in over 25 events and workshops with a reach of over 9,000 audience members to build awareness of our organization and funding opportunities. Sessions ranged from presentations at events hosted by Alberta influencers such as the Edmonton Chamber of Commerce to educational sessions for business delegations. ERA joined groups that traveled from as far away as Norway at the Stampede Investment Forum where global delegates converged in Calgary to learn more about our province's climate leadership.

Additional thought leadership highlights from 2017/18 include:

► **United Nations Climate Change Conference, Bonn, Germany, November 6 to 17, 2017:**

As part of our presence at this international meeting, ERA CEO Steve MacDonald was a panelist during a moderated discussion about Canadian Innovation for a Low-Carbon Future. He also introduced a panel discussion on Sustainable Development Goals, a universal call to action to end poverty, protect the planet, and ensure all people enjoy peace and prosperity. In between speaking engagements, he attended various programs and events focused on implementing the Paris Climate Change Agreement. The conference was attended by representatives from government, non-governmental organizations (NGOs), environmental groups, scientists, and businesses.

► **Intergovernmental Panel on Climate Change (IPCC) Cities and Climate Change Conference, Edmonton, March 3 to 8, 2018:**

Participation at IPCC Cities Conference allowed ERA to raise awareness and network with a unique international audience who would not otherwise be in Edmonton. Our CEO, Steve MacDonald, moderated the Made-in-Alberta Carbon Utilization Technologies Panel, curated in part by the ERA team. The talk focused on the opportunity to turn carbon from a waste to an asset at a regional, national, and international scale. The ERA team also managed a booth onsite, sponsored and spoke at a Pembina Institute side event focused on strategic climate action in cities. The panel attracted over 100 attendees and the conference reached over 800 delegates.

► **Globe Leadership Summit for Sustainable Business, Vancouver, March 14 to 16, 2018:**

In addition to profile at the Alberta Pavilion, ERA team members shared their expertise through the Alberta Clean Innovation panel, the International CCS Knowledge Centre Forum, and during the Alberta Innovation Showcase. They participated in global networking opportunities during International Emissions Trading Association Carbon Day, supported the Mission Innovation Clean Energy Technology Matchmaking event, and judged three pitch sessions, including the Smart Grid and Sustainable Transportation pitch, the Carbon Utilization and Storage pitch, and the Rapid-fire Session. Grand Challenge projects were also profiled through speaking opportunities secured by ERA. Globe attendance reached 1,500.

► **Mission Innovation: Carbon Capture, Utilization, and Storage, Houston, Texas, September 26 to 28, 2017:**

Mark Summers, Executive Director of Technology and Innovation, helped write recommendations for future research and development investments in the areas of carbon capture, storage, and utilization (CCUS). The workshop, hosted by the United States in conjunction with Saudi Arabia, brought together 260 of the world's leading CCUS experts from academia and industry. Participants published a report including an international consensus on the most critical scientific challenges associated with CCUS and established a set of 30 prioritized research directions.



Kathy Sendall, ERA Board Chair; Brian Vaasjo, President and CEO Capital Power; and Dan Wicklum, Chief Executive COSIA discuss 'What the Marketplace Wants' at SPARK 2017 in Edmonton.

SPARK

CONNECTING INNOVATORS. ADVANCING



ERA



STRATEGIC PRIORITY: DRIVE COMMERCIALIZATION

**Q&A WITH ELIZABETH SHIRT, EXECUTIVE DIRECTOR,
POLICY AND STRATEGY**

40

OVERVIEW OF COMPLETE SOLUTIONS FOCUS

42

ALIGNING THE INNOVATION SYSTEM

44

COMMERCIALIZATION SERVICES

46

**COMMERCIAL VIABILITY OF CLEAN
TECHNOLOGY INVESTMENTS**

48

MEASURING GDP AND EMPLOYMENT IMPACT

50



Q&A with Elizabeth Shirt

EXECUTIVE DIRECTOR, POLICY AND STRATEGY

Why are complete solutions necessary to accelerate projects to reduce GHGs? How do you actually “convene” complete solutions?

ERA is about identifying and accelerating solutions that reduce GHGs and improve our economic competitiveness. But, just finding a promising technology isn't enough. The best ideas don't always turn into products or companies that reduce emissions. To get to that place you need a sound business model. You need to know who your customer is and be certain your idea meets a need in the market. Even then, you need the right team in place to get it there. You also need capital—sometimes a lot of it—and a strong regulatory and policy environment. A great idea is not enough. You need all these other components in place—we call these complete solutions.

Part of what we do best is identifying technologies with the most potential to cut carbon and cut costs. When we examine proposals, we also focus on complete solutions. An additional source of capital is one way to demonstrate there is a market, we look for that. If a great idea comes our way, but lacks a strong business plan, our partnerships with commercialization service providers like TEC Edmonton or Calgary Technologies Inc. help innovators with the business side of things. We also work with government and industry to make sure all funding agencies know what is coming down the pipe. This helps to mitigate some of the hurdles innovators will face from idea generation to commercialization. As a convener, that's a big role.

Why is leveraging funding through partnerships so important? What's new and how do we do it?

Historically, in Canada, we've been good at ideas. Where we've struggled is moving them through scale-up and deployment. There is a greater push for funding partners to work together and select the opportunities that'll make a positive impact. Understanding and aligning on priorities instead of just working in isolation is key. A great example is the CCITF announced in December 2017. It clarifies the innovation and technology priorities of the province and each agency's role and areas of focus within it.

The amount of investment required to reach our climate change goals is big. The notion of partnering has been talked about for a long time. In recent years it has become more real. We recognize that to meet goals and remain competitive we need to be very purposeful with our actions. We need to work

together—government and industry—to make sure we get at the core of the problem. Our trusted partner model is a great example. It is helping relieve administrative burdens for industry to apply and get funding; that's time and money better spent on developing the technology and business side of things.

Can you speak to balancing “policy push” from government and what you are doing to foster “market pull” from industry?

We invest public money and our mandate is to reduce GHG emissions. To do this, we are driven by goals and outcomes set by the province. The Alberta Climate Leadership Plan is the big driver. It sets objectives for oil sands and methane emissions, as well as renewable energy. Those pillars drive what we focus on from an investment standpoint. At the same time, industry is changing their behavior to decrease their environmental impacts and remain competitive in producing or manufacturing. Industry is looking for ways to do what they do, but better. So, we have to keep in mind, what are the solutions they need? Balance is about finding the sweet spot. All our funding opportunities focus on this; the solutions that industry needs to meet outcomes Alberta is looking for. It is a very deliberate approach; how can we help you achieve these outcomes? What are the challenges you have? The desire is to improve how we do things while remaining competitive in a low carbon world.

What are the benefits of aligning on GHG methodology?

There is a need to quantify our return on investment when it comes to GHG reductions. With the CCITF, we needed a common methodology to measure and estimate the outcomes of funded projects and programs. ERA has a long history of doing this. We've primarily focused on measuring GHG reductions since we started, with economic development as an important secondary aspect. Because of our history, we worked with our partners on coming to an agreed upon GHG methodology, so we can all align on opportunities for investment. Our process is rigorous, it has stood up to scrutiny and it is based on international quality management standards. We've used this measurement approach since we formed in 2009, and it's encouraging that CCITF launched with it as a common way to for everyone to move forward.





Overview of complete solutions focus

We know that funding alone will not advance new technologies to commercialization or result in the low carbon economy envisioned for Alberta. 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. Public funding is not enough to accelerate these new technologies. Addressing these gaps requires an all-hands-on-deck approach, with government and industry sitting at the same table. To support economic diversification, job creation, education, training, and climate change action, we work in close alignment with the evolving Alberta innovation system.

Balancing 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. We invest 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.

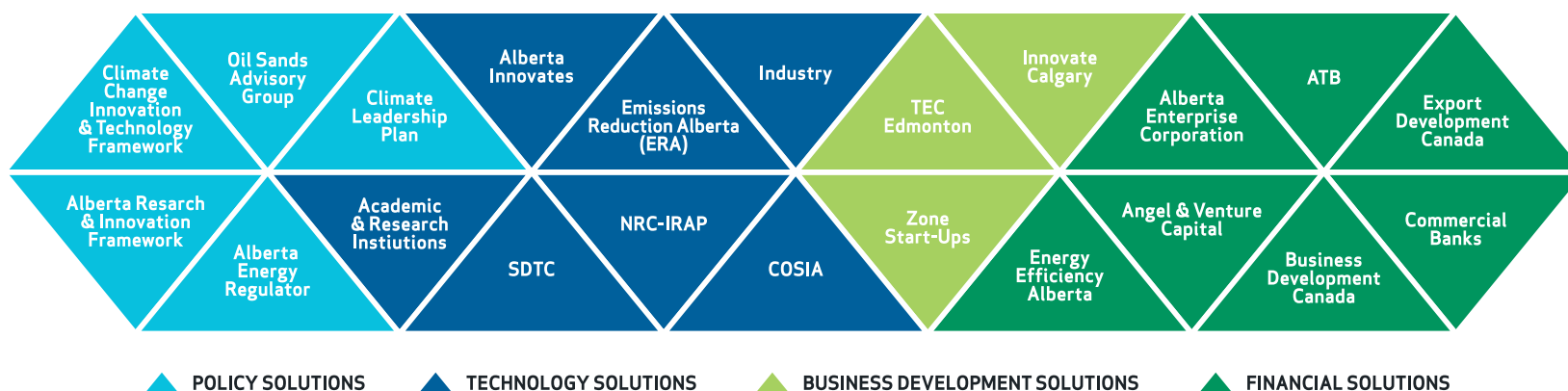
Some highlights from 2017/18 include:

- Hosted Industrial Efficiency and BEST Challenge Workshops with government and industry to ensure funding calls are designed to achieve policy outcomes and seek solutions industry needs
- Ongoing collaboration with the Alberta Energy Regulator (AER) on the development of both our Methane and Oil Sands Innovation Challenges. AER is also engaging with Methane Challenge project proponents to ensure regulation is not a barrier to developing and deploying technologies to monitor, detect, and reduce methane emissions.

Business development and competency gaps

Even with strong demand from the market, deployment of new technology requires a successful business model that must identify a 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.

In 2017/18, we worked closely with TEC Edmonton, Calgary Technologies Inc., and Alberta Innovates' Entrepreneurial Investments team to increase technology commercialization support for SMEs, mentorship, and funding opportunities. Alberta Innovates' Technology Development Advisors were part of the team that helped SBI BioEnergy Inc. secure an agreement with Royal Dutch Shell for SBI's biofuel technology. We also strengthened our presence on Connectica, a self-service tool for SMEs and service providers to connect with other provincial innovators.

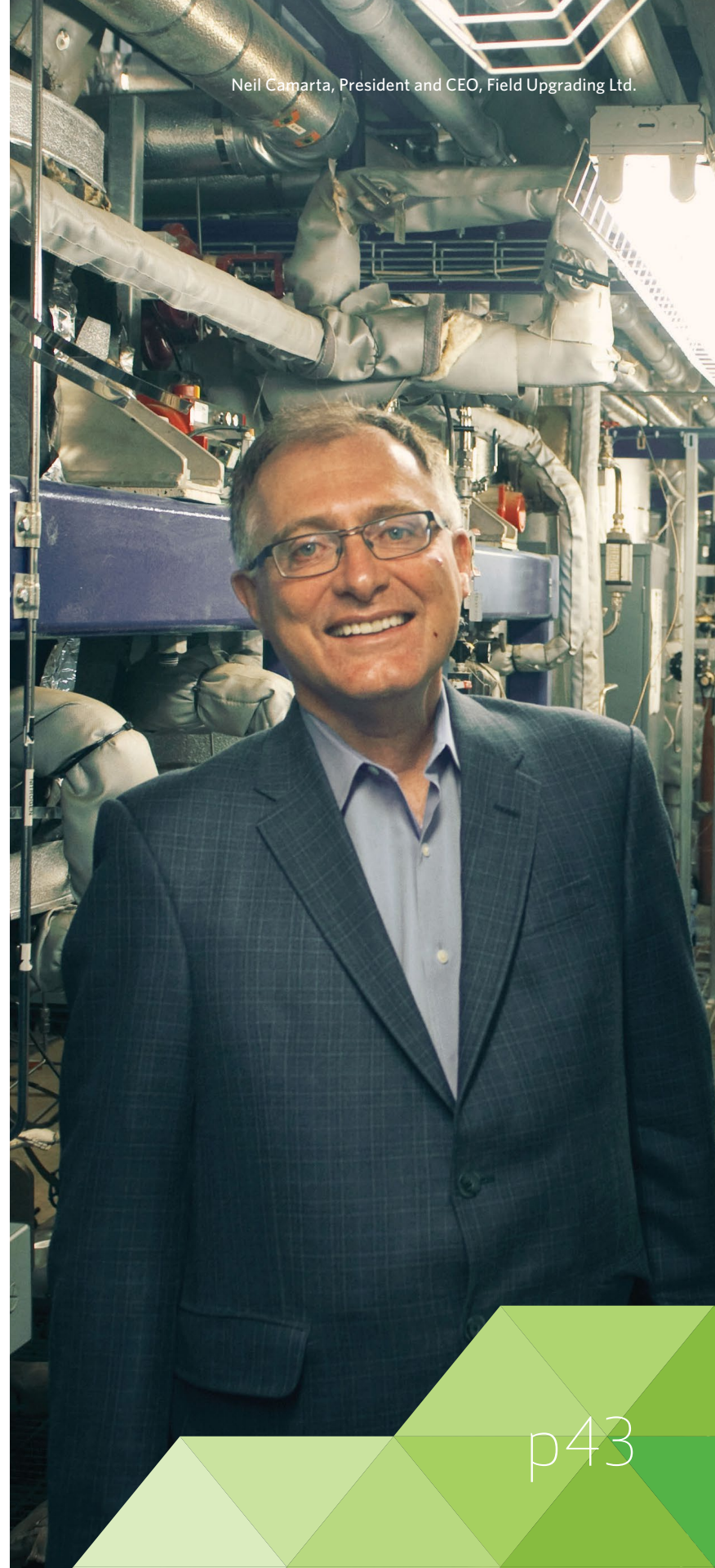


Leveraging capital

Countries are investing billions of dollars in climate change innovation and Alberta's emissions and energy challenges require a scale of investment that responds to its climate leadership ambitions. Clean energy technologies require significant capital investment to develop and commercialize. 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. 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.

In May 2018, Ontario Centres of Excellence (OCE) announced \$3.5 million in funding for Alberta projects also being supported by ERA, Alberta Innovates, and the Natural Sciences and Engineering Research Council of Canada (NSERC). The three ERA projects receiving OCE support address biological resource optimization and methane emissions are:

- ▶ **Multi-Site Cement Industry Low Carbon Fuel Implementation and Supply Chain Optimization**
Partners: Queen's University, Lafarge Canada Inc., University of Calgary, Alberta Innovates, Pembina Institute
- ▶ **Optimization of High Resolution Computational Fluid Dynamics for the Investigation of Atmospheric Boundary Layer at Large Scales**
Partners: University of Guelph, Canadian Natural Resources Limited, Rowan Williams Davies & Irwin Inc. (RWDI), University of Alberta
- ▶ **Satellite-Aircraft Hybrid Detection and Quantification of Methane Emissions**
Partners: University of Toronto, Sinclair Interplanetary, GHGSat Inc.



Aligning the innovation system

We know strong partnerships are key to achieving success. We work on an ongoing basis to build and maintain strong partnerships that enable us to maximize and leverage shared investment capacity and expertise. This includes access to financing, policy, regulatory, and business innovation. We continue to broaden partnerships with organizations like SDTC and NRCan, while bringing together diverse stakeholders to directly promote and authenticate Alberta as a global leader on mitigating GHG emissions through technology innovation.

Of special note is our critical partnership with Alberta Innovates, who provides ERA with expert resources to inform our investment decisions. Together, we have built a strong knowledge base that allows our organizations to work more efficiently to accelerate technology development. We also collaborate with industry partners, including large final emitters, technology developers, and organizations such as Canada's Oil Sands Innovation Alliance (COSIA), the Clean Resources Innovation Network (CRIN), and Energy Storage Canada. We also keep connected with key components of the innovation ecosystem, including Alberta Climate Change Office (ACCO), The Alberta Research and Innovation Framework (ARIF), The CCITF, The Oil Sands Advisory Group (OSAG), and Energy Efficiency Alberta (EEA).

Joint Federal-Provincial funding announcement with Alberta Innovates and SDTC

For the first time, we combined efforts with Alberta Innovates and SDTC to fund technologies from SMEs that enhance environmental stewardship and support economic development in Alberta. ERA funded four of the 11 projects announced.

There is potential for these technologies to reduce cumulative market GHG emissions by more than 300,000 tonnes by 2030.

Over 175 submissions were received through two separate competitions, ranging from prototype development, field pilots, and commercial scale demonstration projects. Each funding process offered applicants a streamlined, harmonized model with one window of access to two pools of money. The companies selected for support are from across Canada, but all technologies are being tested in Alberta. Projects were required to secure a minimum one-third of the total funding from non-government sources.

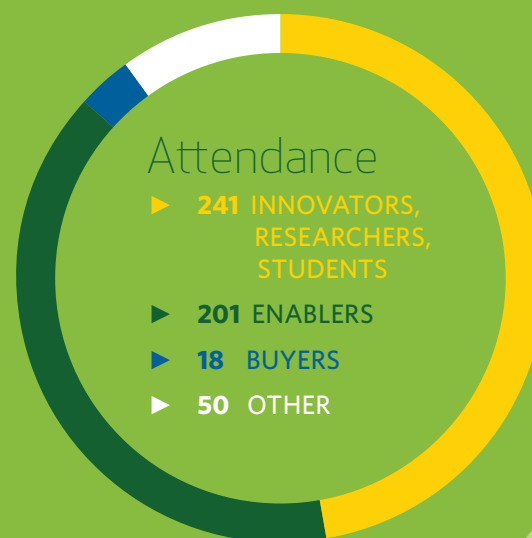
Inaugural SPARK conference sells out

More than 560 innovation and business leaders converged in Edmonton, November 6-8, 2017 to participate in SPARK 2017. The conference, co-hosted by ERA and Alberta Innovates, featured more than 80 thought leaders and brought cleantech researchers and innovators together with representatives from the business community, government, and the innovation system. SPARK's purpose was to connect and create collisions for innovators to advance clean technology and bioindustrial solutions toward commercialization. SPARK was a showcase for our complete solutions approach to accelerate Alberta's bioeconomy and reduce GHG emissions.

In our post event survey, the overall quality of the conference was rated highly, securing an average of 4.5/5. This covered all aspects of SPARK, including conference organization, venue quality, audiovisual quality, program, and conference website, registration, and payment process. Most respondents felt the value of the conference relative to the price paid to attend was reasonable. A key takeaway from this first-time event centred on our innovation showcase, which secured our lowest satisfaction rating (3.71/5). The showcase presents an opportunity for improvement as we plan for SPARK 2019.



Spark 2017 generated 10 unique media stories shared through CTV Edmonton and Calgary (CTV aired three distinct stories, one aired in Edmonton and two in Calgary), the *Calgary Herald*, *Edmonton Journal* and *High River Times*.



Commercialization services

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. To advance technologies towards commercialization, we 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.

Incubator and accelerator partnerships

We engaged Alberta's incubators and accelerators to participate in project review and provide business development support to help move technologies toward commercialization. Technology commercialization is fostered by the assignment of a Project Advisor to each opportunity we invest in. These project advisors are supported by personnel and expertise from Calgary Technologies Inc. (formerly Innovate Calgary) and TEC Edmonton (CTI:TEC).

Business coaching, subject matter expertise, and broader access to the innovation ecosystem all contribute to success. It takes an "innovation village" to see new technologies grow up and succeed. CTI:TEC resources actively collaborate with and support our team by providing reviewers to evaluate project submissions, create awareness of technologies that are a "fit" with our mandate, and assist with the development of our programs and services.

Highlights of CTI:TEC partnership in 2017/18 include:

- ▶ CTI:TEC made introductions to several potential pilot partners for Multi Sensor Scientific (MSS) in both upstream and oil sands sectors, as well as strategic ecosystem partners. MSS has worked closely with CTI:TEC to establish a presence in the Alberta innovation and methane ecosystems.
- ▶ ZKO Oilfield Industries Inc. (ZKO) has been working closely with CSA and Peyto Resources Ltd. to begin in-field installation of their IPTG (in-pipe turbine generator) units since early 2018. CTI:TEC spent considerable time working to build ZKO's business strategy and formal business plan. CTI:TEC assigned a mentor to work one-on-one with ZKO to ensure long-term commercial success remained a key focus.
- ▶ Viresco Solutions Inc. is pursuing the reduction of methane production in cattle by way of a feed additive. The project, conducted at an Alberta cattle feedlot, has international commercialization

opportunities. CTI:TEC is supplying market research capability and agribusiness and veterinary science subject matter expertise to the project team. Mapping of the beef value chain in Alberta and industry economics allowed Viresco to better plan for market entry.

- ▶ CTI:TEC provided business mentoring services to CarbonCure Technologies. The company manufactures a bolt-on technology that introduces recycled CO₂ into fresh concrete. Concrete producers benefit from improved operations, while offering designers and developers the ability to reduce the carbon footprint of building projects. In April 2018, CarbonCure was named one of ten finalists in the global \$20 million NRG COSIA Carbon XPRIZE.

Innovator Support Pilot

Our efforts to act not only as a funder, but also a convener, have been demonstrated by our work on the Innovator Support Pilot. Introduced in our 2017-2020 Business Plan, the program targets projects or technologies that show promise, yet did not qualify for funding due to specific challenges. In 2017/18, we began incorporating "commercial potential" criteria for each project through our funding applications and contribution agreements. ERA has now initiated the process of developing criteria to determine what constitutes a "promising" project or technology that merits additional time and resources. Our unique position in Alberta's innovation system allows us to leverage and convene capacity and utilize knowledge of existing entities and experts. In 2017/18, we identified an onboarding process for past projects, along with a series of potential projects that would be considered for the Pilot.

Ensuring a range of perspectives is important when evaluating project needs. We are now configuring a review team to assist in identifying potential barriers to project commercialization and the resources required to overcome these barriers. This approach will assist technology developers aiming to meet our criteria for future funding. In 2018/19, we will continue to leverage our existing financial and human capital resources within our network, working closely with Alberta Innovates, CTI:TEC, and other service providers to allow Pilot participants to access untapped potential.



Commercial viability of clean technology investments

We celebrate and communicate our expertise, successes, and learnings through all ERA communication channels. We publish final reports for projects, share successes through our annual report, and provide project summaries on our website.

In 2017/18, we pursued an opportunity to get a better understanding of the lessons learned and to share these learnings with those who may be able to innovate faster because of this knowledge translation. We developed 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.

First lessons learned event showcases Brooks Solar

In January 2018, Elemental Energy finished construction of its solar facility near Brooks, Alberta. ERA invested \$15 million to accelerate the development of this project. The site spans 68 acres and includes 48,000 solar panels. Brooks is the first utility scale solar project in Western Canada; at 17 megawatts it can produce enough power for 3,000 homes and at peak, 15,000 homes.

In March 2018, approximately 200 people joined us for our first Lessons Learned event, a showcase of Brooks Solar. Elemental Energy, National Bank of Canada (project financier), the County of Newell, and representatives from the Alberta Electric System Operator (AESO) and Fortis spoke at the event. Our post-event survey proved the event provided valuable insight for the audience—many of whom were there to learn how they can accelerate their own solar projects in Alberta. One hundred per cent of attendees said they would recommend ERA Lessons Learned events in the future.

This innovative project demonstrates advantages and performance of large-scale solar power in the province. In addition to reducing GHG emissions, Brooks Solar delivered direct benefits to the community. Local labour and subtrades were engaged in a variety of roles, supporting economic development and long-term capacity building in the rapidly growing renewable energy sector.

In 2018/19, ERA will continue to host Lessons Learned events with the intent to accelerate technology adoption by quickly sharing lessons learned by our project proponents.

Launching Brooks Solar. Lessons learned:



Location, location, location: This area's sunny climate and proximity to several large transmission lines made it an ideal location for the renewable energy project.



The importance of community engagement: Scheduling regular meetings with community members to ensure any concerns over a project this size is addressed well in advance of the project is a critical step in the engagement process.



Technology: Alberta has difficult climate conditions; winter weather conditions, cold temperatures, and hail are all factors that can impact solar technology. Lessons were shared on how the inverters were configured and how the system was configured overall to maximize performance.



Financing: Speakers outlined what the banks require to get behind a project of this scale, including the assurance the power generated could be sold.



Contractors' Installation Techniques: Take Alberta's weather conditions into consideration when planning. Execute as much construction in summer as possible and pre-assemble equipment offsite to minimize onsite hours.



Timing: Elemental Energy started the construction in June 2017 and finished in December. This was a seven-month construction project and there were lots of learnings on how to de-risk a new technology and prepare for commissioning a solar plant in the middle of December.



Measuring GDP and Employment Impact

In 2017, the Alberta Ministry of Economic Development and Trade carried out an analysis on behalf of ERA to better understand the economic impact of our investments. We leveraged this work and produced an update to that analysis in the spring of 2018.

That work confirmed that:

- ▶ For every ERA dollar we commit to advancing new technologies, another \$6 has been invested by funding partners.
- ▶ According to analysis by Alberta Economic Development and Trade in 2018, our projects have a total cumulative impact of over 12,000 person-year* jobs and add \$2 billion to Alberta's GDP from 2011 to 2023.
- ▶ While we boost Alberta's economy, our impact can be felt across Canada as well. ERA projects will add \$2.7 billion to the nation as a whole from 2011 to 2023 and increase employment to over 18,000 person-year jobs.

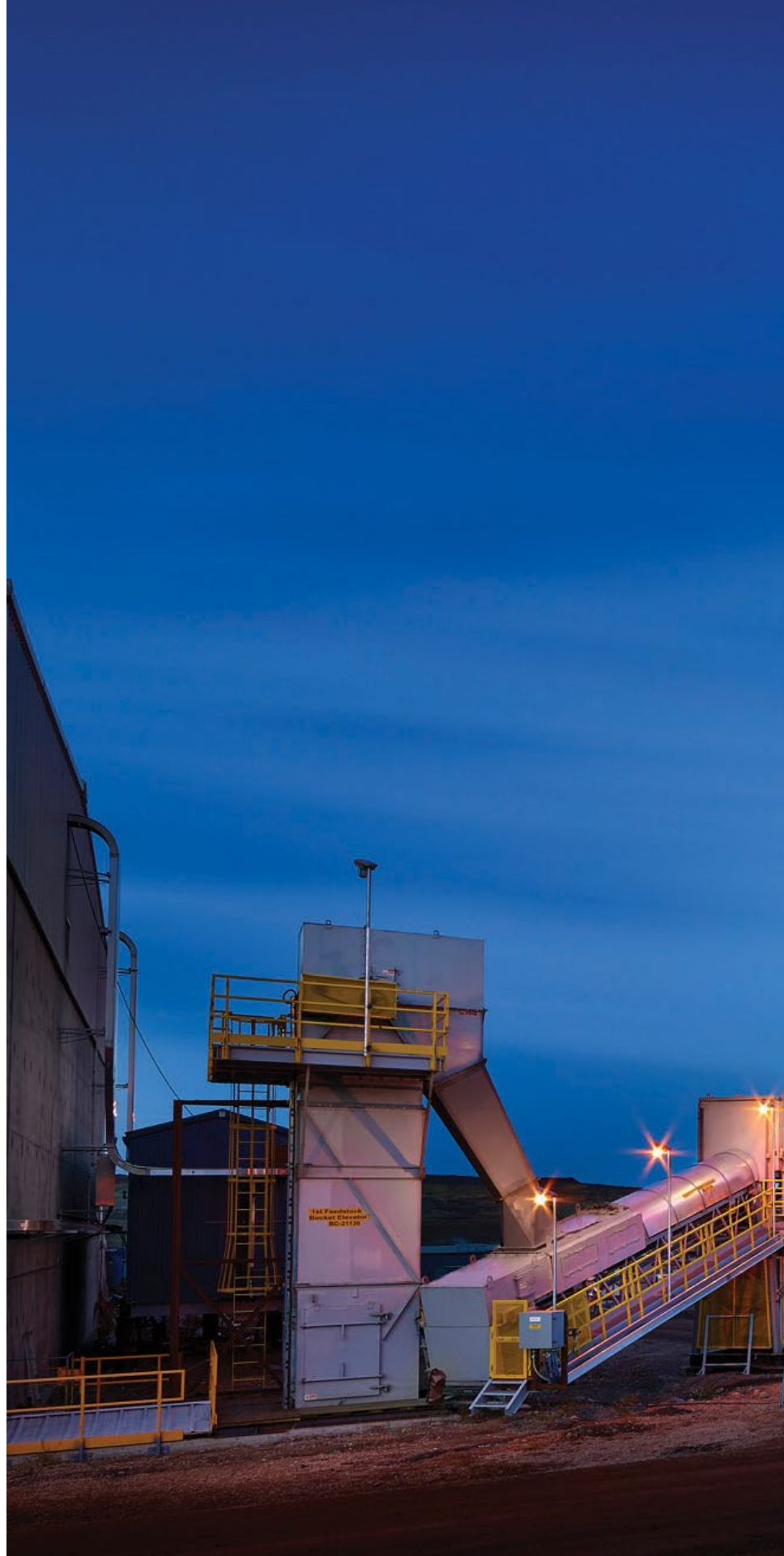
12,000
PERSON-YEAR
JOBS IN ALBERTA
BY 2023

18,000
PERSON-YEAR
JOBS IN CANADA
BY 2023

\$2
BILLION
GDP IMPACT
TO ALBERTA
BY 2023

\$2.7
BILLION
GDP IMPACT
TO CANADA
BY 2023

**A person-year is equal to one-year of employment for one individual.*





ERA



STRATEGIC PRIORITY: MAXIMIZE IMPACT

LEVERAGED INVESTMENT	54
----------------------	----

STAKEHOLDER AWARENESS	54
-----------------------	----

OPERATING COSTS AS A PERCENTAGE OF APPROVED PROJECT COMMITMENTS	58
--	----

LENGTH OF ERA INTAKE AND DECISION-MAKING CYCLE	59
--	----

Leveraged investment

Government plays a key role in developing and commercializing clean technologies and innovation through investments. Leveraged investment is additional funding from other sources and partners for every dollar invested. Our project funding is leveraged, and we require that every ERA dollar invested is at least matched by private resources.

We have had very strong results; we find on average that for every dollar we invest in a project, more than another six 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 Environment and Climate Change Canada's Low Carbon Economy Leadership Fund. We have established collaborative relationships under our Partnership Intake Program with both NRCan and SDTC. Having these agencies take part in ERA's review process allows us to explore potential co-funding opportunities under these and other programs.

In 2017/18 ERA projects will be further leveraged by:

- ▶ An additional \$8 million in funding from Environment Canada, which will be made available for the Industrial Efficiency Challenge
- ▶ Co-funding from Ontario Centres of Excellence (OCE) for three projects under ERA's Methane Challenge (announced in 2016/17)
- ▶ Additional funding from Business Development Bank of Canada (BDC) for Enlighten Innovations' CLEANSEAS technology—an Oil Sands Innovation Challenge winner.

Stakeholder awareness

In November 2017, we conducted a research project to determine the level of awareness, familiarity and support for ERA and its mandate. This research will help us better understand public and stakeholder opinions, make informed business decisions, provide baseline metrics for awareness, and track communications efforts moving forward.

We completed:

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

Research highlights:

- ▶ The most engaged key stakeholders hold very high regard for the ERA mandate (and high regard for its staff and leadership in addressing this mandate); 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 our mandate, and 44 per cent agree ERA's role in helping the province achieve its climate leadership goals is very important.
- ▶ 60 per cent of key stakeholders (informed Albertans) are very aware of ERA; with 70 per cent aware of ERA's goals.
- ▶ 92 per cent of these key stakeholders support ERA's goals with 87 per cent in agreement ERA's role in helping the province achieve its climate leadership goals is important.
- ▶ Two thirds of stakeholders would recommend others apply for funding through ERA.



Evaluating our email campaign analytics

In 2017/18, we sent 21 email campaigns that share our success stories, conference information, and funding opportunities. Two key metrics, open rate and click rate, significantly exceed industry averages when compared to data compiled by our email marketing service.

METRICS	ERA AVERAGE	GOVERNMENT AVERAGE
Opens	36.74%	26.52%
Clicks	5.96%	3.65%
Unsubscribes	.23%	.13%

Research insights influenced our approach in 2017/18. We identified the following opportunities:

OPPORTUNITY	ACTIONS
Increase visibility on a national and global level of ERA as a leader in the development of technologies that reduce GHG emissions among the relevant players in carbon emissions reduction and innovation.	<ul style="list-style-type: none"> ▶ Hosted the sold-out SPARK 2017, attracting more than 560 innovation and business leaders ▶ Participation in the Globe Leadership Summit for Sustainable Business, United Nations Climate Change Conference, Intergovernmental Panel on Climate Change (IPCC) Cities and Climate Change Conference ▶ Over 200 media articles referencing ERA (online and in print) with a potential reach of 644 million.
Increase collaboration with funders and like organizations nationally and internationally—more leveraging of funding and partnering where goals are aligned.	<ul style="list-style-type: none"> ▶ Worked alongside trusted partners, SDTC, Alberta Innovates, NRC-IRAP, Clean Growth Hub and NSERC to plan an educational workshop to help innovators maximize their funding ▶ 6 MOUs signed in 2017/18 <ul style="list-style-type: none"> ▷ 10 MOUs in total ▶ CCITF launched using ERA GHG methodology.
Grow continuous intake as well as Calls for Proposal on a specific theme.	<ul style="list-style-type: none"> ▶ Completed tech scouting activities to prepare projects to the Board for consideration in the 2018/19 fiscal year ▶ Launched the Industrial Efficiency Challenge ▶ Announced nine new Oil Sands Innovation Challenge projects ▶ Designed ERA's integrated call focused on biotechnology, electricity and sustainable transportation.
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.	<ul style="list-style-type: none"> ▶ Hosted stakeholder workshops to gain insights to shape 2017/18 Call for Proposals ▶ Continued communications outreach to stakeholders through ERA update ▶ Increased communication activities on LinkedIn and Twitter has led to increased engagement levels.
Increase transparency at the adjudication stage—how proposals are adjudicated and feedback for unsuccessful proposals.	<ul style="list-style-type: none"> ▶ The adjudication process is overseen by an independent fairness monitor to ensure the process is carried out in a transparent manner, and that all applicants are treated fairly and equitably ▶ Independent experts and evaluators with backgrounds in business, financing, science, engineering, and GHG quantification support the selection of projects.
Ensure the findings of funded research are utilized—if they are successful, aid project proponents in finding partners to move projects through to commercialization; if they are unsuccessful, ensure the findings can be used to benefit future research.	<ul style="list-style-type: none"> ▶ Published Project Final Reports on our website ▶ Hosted ERA's first Lessons Learned event with a focus on Brooks Solar ▶ Planning underway for new Lessons Learned events in 2018/19.



Watching our website

Monitoring our website performance provides us with insights on how our site behaves. It helps to enhance the user experience and see if we are attracting the right audience with our communications strategy. In 2017/18, our site has seen an 11 per cent increase in users and 24 per cent increase in total sessions.

METRICS	JUNE 1, 2016 - MAY 31, 2017	JUNE 1, 2017 - MAY 31, 2018
Users	27,211	30,308
Sessions	40,258	50,040
Pageviews	139,955	111,504
Pages per session	3.48	2.23
Average duration	2:35	2:08
Bounce rate	40.44%	59.63%

Operating costs as a percentage of approved project commitments

Our 2017/18 operating costs were \$4.1 million, compared to \$5.3 million in 2016/17. This represents a 23 per cent decrease. While we continued to work on engagement and preparation for upcoming calls, a big contributor to this variance is lower operating costs from completing one funding call instead of two.

Another measure of efficiency is operating costs as a percentage of the funds required to fulfill project commitments approved by our Board of Directors. In 2017/18, our operating costs were 2.2 per cent of total funds committed to projects. This is down from 3.2 per cent the prior year because of the decrease in operating costs and increase in committed funds, and the significant commitment from the Oil Sands Innovation Challenge compared to \$54 million in 2016/17 for three funding calls.



Adam Legge, moderator; Steve MacDonald, ERA CEO; Laura Kilcrease,
Alberta Innovates CEO.

Length of intake and decision-making cycle

Our funding process invites submissions for consideration through a competitive call for proposals. This process includes two stages of expert review prior to a Board decision and has proven to be an effective way to ensure that the best projects are selected. In the past, the duration of the process has been identified as a barrier to some applicants' success. In 2016/17, ERA effectively shortened the turnaround time for funding approval from about seven and a half to five and a half months and kept to this commitment in the 2017/18 fiscal year.

In 2017/18, we hosted stakeholder workshops to help shape our Call for Proposals. Project applicants wanted more time to prepare their submissions and wanted a simplified Expression of Interest (EOI) application. As a result, we made certain applicants had a minimum of eight weeks for EOI submission for both the Industrial Efficiency Challenge—which included a reduced 8-page document limit instead of 10—and the Oil Sands Innovation Challenge.

ERA



FINANCIALS

INDEPENDENT AUDITOR'S REPORT	63
-------------------------------------	-----------

STATEMENT OF FINANCIAL POSITION	64
--	-----------

STATEMENT OF CHANGES IN NET ASSETS	65
---	-----------

STATEMENT OF OPERATIONS	66
--------------------------------	-----------

STATEMENT OF CASH FLOWS	67
--------------------------------	-----------

NOTES TO FINANCIAL STATEMENTS	68
--------------------------------------	-----------





Deloitte LLP
1500 Manulife Place
10180 - 101 Street
Edmonton AB T5J 4K1
Canada

Tel: 780-421-3611
Fax: 780-421-3782
www.deloitte.ca

Independent Auditor's Report

To the Board of Directors of
Climate Change and Emissions Management (CCEMC) Corporation (operating as Emissions Reduction
Alberta)

We have audited the accompanying financial statements of Climate Change and Emissions Management (CCEMC) Corporation (operating as Emissions Reduction Alberta), which comprise the statement of financial position as at May 31, 2018 and the statements of changes in net assets, operations and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian accounting standards for not-for-profit organizations, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of Climate Change and Emissions Management (CCEMC) Corporation (operating as Emissions Reduction Alberta) as at May 31, 2018 and the results of its operations and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

A handwritten signature in dark ink that reads "Deloitte LLP".

Chartered Professional Accountants
September 25, 2018

Statement of Financial Position

AS AT MAY 31, 2018

	2018	2017
Assets		
Current assets		
Cash	\$377,597,150	\$277,292,114
Accounts receivable	\$23,371	\$41,560
Grant receivable (note 3)	\$20,000,000	-
Interest receivable	\$628,420	\$257,308
Prepaid expenses	\$10,683	\$29,072
	<u>\$398,259,624</u>	<u>\$277,620,054</u>
Non-current assets		
Property and equipment	\$36,453	\$1,907
Grant receivable (note 3)	\$10,000,000	-
	<u>\$408,296,077</u>	<u>\$277,621,961</u>
Liabilities		
Current liabilities		
Accounts payable and accrued liabilities	\$1,849,449	\$2,630,535
Net Assets		
General Fund - unrestricted	-	-
Restricted Fund (note 4)	\$406,446,628	\$274,991,426
	<u>\$408,296,077</u>	<u>\$277,621,961</u>
Commitments and guarantees (note 6)		

Approved by the Board of Directors


DIRECTOR


DIRECTOR

The accompanying notes are an integral part of these financial statements.

Statement of Changes in Net Assets

FOR THE YEAR ENDED MAY 31, 2018

			2018	2017
	General Fund	Restricted Fund	Total	Total
Balance - Beginning of year	-	\$274,991,426	\$274,991,426	\$265,936,839
Excess of revenue over expenses for the year	-	\$131,455,202	\$131,455,202	\$9,054,587
Balance - End of year	-	\$406,446,628	\$406,446,628	\$274,991,426

The accompanying notes are an integral part of these financial statements.

Statement of Operations

FOR THE YEAR ENDED MAY 31, 2018

			2018	2017
	General Fund	Restricted Fund	Total	Total
Revenue				
Grant revenue (note 3)	-	\$164,500,000	\$164,500,000	\$33,000,000
Interest income	-	\$4,694,781	\$4,694,781	\$3,057,450
Conference	\$435,065	-	\$435,065	-
	<u>\$435,065</u>	<u>\$169,194,781</u>	<u>\$169,629,846</u>	<u>\$36,057,450</u>
Project expenses (note 6)	-	\$34,084,578	\$34,084,578	\$21,654,278
Excess of revenue over project expenses	<u>\$435,065</u>	<u>\$135,110,203</u>	<u>\$135,545,268</u>	<u>\$14,403,172</u>
Operating expenses				
Program management (note 5)	-	\$2,828,246	\$2,828,246	\$4,383,880
Consulting contracted services	-	\$408,496	\$408,496	\$474,281
Corporate costs	-	\$225,224	\$225,224	\$187,438
Amortization	-	\$8,006	\$8,006	\$1,271
Board remuneration and expenses (note 5)	-	\$93,021	\$93,021	\$72,014
Professional fees	-	\$43,350	\$43,350	\$47,910
Insurance	-	\$10,788	\$10,788	\$11,185
Conference	\$435,065	\$37,870	\$472,935	\$170,606
	<u>\$435,065</u>	<u>\$ 3,655,001</u>	<u>\$ 4,090,066</u>	<u>\$ 5,348,585</u>
Excess of revenue over expenses for the year	<u>-</u>	<u>\$ 131,455,202</u>	<u>\$ 131,455,202</u>	<u>\$ 9,054,587</u>

Statement of Cash Flows

FOR THE YEAR ENDED MAY 31, 2018

	2018	2017
Cash provided by (used in)		
Operating activities		
Excess of revenue over expenses for the year	\$131,455,202	\$9,054,587
Amortization	\$8,006	\$1,271
Net change in non-cash working capital items		
Accounts receivable	\$18,189	\$807,352
Grant receivable	\$(30,000,000)	-
Interest receivable	\$(371,112)	\$18,194
Prepaid expenses	\$18,389	\$(27,374)
Accounts payable and accrued liabilities	\$(781,086)	\$(606,907)
	<u>\$100,347,588</u>	<u>\$9,247,123</u>
Investing activities		
Purchase of capital assets	\$(42,552)	-
Increase in cash during the year	<u>\$100,305,036</u>	<u>\$9,247,123</u>
Cash - Beginning of year	<u>\$277,292,114</u>	<u>\$268,044,991</u>
Cash - End of year	<u>\$377,597,150</u>	<u>\$277,292,114</u>

The accompanying notes are an integral part of these financial statements.

Notes to Financial Statements

1. Organization

Climate Change and Emissions Management (CCEMC) Corporation (CCEMC) is an Alberta-based, independent, not-for-profit organization incorporated under the Canada Corporations Act on February 17, 2009 and continued under the Canada Not-For-Profit Corporations Act on October 14, 2016; its operations commenced on June 1, 2009. On October 21, 2016, CCEMC registered the trade name of Emissions Reduction Alberta (ERA) and uses this as its operating name. ERA's mandate is to identify and accelerate innovative solutions that secure Alberta's success in a lower carbon economy. The Climate Change and Emissions Management Fund (the Fund) was established under the Climate Change and Emissions Management Act by the Government of Alberta to support investment in innovation and clean technologies that will reduce Alberta's emissions of specified gases and support its ability to adapt to climate change. The Fund provides the primary source of revenue for ERA. As a not-for-profit organization, ERA is exempt from tax in accordance with Section 149(1)(l) of the Canadian Income Tax Act.

2. Summary of significant accounting policies

These financial statements have been prepared by management in accordance with Canadian accounting standards for not-for-profit organizations (ASNPO) within the framework of the accounting policies summarized below.

Fund accounting

For financial reporting purposes, the accounts have been classified into the following funds:

► General Fund

The General Fund includes all resources available for immediate purposes and accounts for ERA's activities other than those directly attributable to funding innovation and clean technologies and adaptation to climate change.

The General Fund includes all unrestricted monies received that are available for use at ERA's discretion.

► Restricted Fund

The Restricted Fund includes those funds that are to be used to support investment in innovation and clean technologies and adaptation to climate change.

Revenue recognition

These financial statements have been prepared using the restricted fund method of accounting for contributions, the key elements of which are:

- Unrestricted contributions are recognized as revenue in the General Fund when received or on becoming receivable if the amount to be received can be estimated and collection is reasonably assured.
- Externally restricted contributions are recognized as revenue in the Restricted Fund when received or receivable if the amount to be received can be estimated and collection is reasonably assured. Externally restricted amounts can only be used for the purposes designated by external parties.
- Investment income earned on contributions subject to external restrictions is recorded as revenue in the Restricted Fund in the year it is earned.

Financial instruments

Financial assets and financial liabilities are initially recognized at fair value less transaction costs when ERA becomes a party to the contractual provisions of the financial instrument and subsequently are measured at amortized cost with any changes recorded in the statement of operations. ERA currently does not hold any equity instruments that would be measured after initial recognition at fair value.

Cash

Cash consists of cash on deposit.

Property and equipment

Property and equipment are recorded at cost less accumulated amortization. Amortization is provided on a straight-line basis at the following annual rates:

Computer equipment and software	3 years
Furniture and fixtures	5 years

Project expenses and liabilities

Project expenses and the associated project liability (included in accounts payable and accrued liabilities) are recognized on receipt of a valid project progress report and associated milestone invoices by ERA. A commitment for a project expense is disclosed as such when a contribution agreement is executed.

3. Grant revenue

Funds are granted from the Government of Alberta to ERA on an annual basis through a Grant Agreement. The initial Grant Agreement was dated March 31, 2009, which was effective through to June 30, 2015. The Grant Agreement was amended on March 30, 2010 and was further amended on August 8, 2014. The Government of Alberta announced the New Climate Leadership Plan in April 2016 and a new Grant Agreement was executed on March 8, 2017 and is effective until March 31, 2020, unless extended or terminated in accordance with the agreement. No grant monies were received during fiscal 2016. The annual grant amount for fiscal 2017 was announced in October 2016 and was paid on May 24, 2017. Funding for fiscal 2018 was announced in December 2017 and \$134,500,000 was paid on April 19, 2018.

Included in the letter from the Minister of Environment and Parks, on April 19, 2018, was a commitment of funding for future fiscal years. Committed amounts have been included as grant receivable and are payable as follows:

YEAR ENDED	
May 31, 2019	\$20,000,000
May 31, 2020	\$10,000,000

4. Restricted Fund

The Restricted Fund consists of funds that are externally restricted by the Government of Alberta for the purpose of investing in various initiatives and projects related to reducing emissions of specified gases or supporting Alberta's ability to adapt to climate change as established by the Fund. The funds are also restricted for the purpose of administering ERA, which includes fees, expenses, liabilities and other costs.

5. Board and management remuneration

Total honoraria and expenses related to the directors of the board were \$92,016 (2017 - \$71,171) in the fiscal year. Remuneration paid to directors or their employers includes honoraria totalling \$45,093 (2017 - \$33,668) as follows:

	2018	2017
C. Bak (a)	\$8,559	\$2,721
D. Beever (b)	-	-
R. Blackwood (e)(f)	-	-
J. Carter (c)	\$580	\$2,144
P. Clark (b)	-	\$82
J. Doucet	\$4,705	\$2,697
I. Evans (d)	-	\$1,018
S. Hastings-Simon (a)	\$4,185	\$2,041
B. Kenny	\$5,569	\$5,048
S. Locke (f)(g)	-	-
R. Mansell	\$5,527	\$5,398
C. Mather (a)	\$6,282	\$2,868
P. Mohr	\$3,524	\$3,250
K. Sendall	\$6,162	\$6,401
A. Tasker (b)	-	-
D. Wicklum (d)(f)	-	-
	\$45,093	\$33,668

a) Appointed December 2016

b) Term expired June 2016

c) Resigned September 2017

d) Term expired September 2016

e) Resigned February 2017

f) Honoraria have been waived by these directors

g) Resigned May 2018

Of these amounts, \$3,911 (2017 – \$3,039) is included in accounts payable and accrued liabilities. Expenses paid to directors of \$46,923 (2017 – \$37,503) relate to reimbursements for meals, travel and accommodation.

Program management expenses include remuneration to contract management who report directly to the board, totalling fees of \$305,130 (2017 – \$323,085); of this amount, \$31,532 (2017 – \$37,485) is included in accounts payable and accrued liabilities.

6. Commitments and guarantees

During the year, contribution agreements for ERA funding were executed for eighteen projects and cancelled for one project. As at May 31, 2018, ERA has 118 executed contribution agreements outstanding and has commenced or completed funding for 108 of these approved projects. Funding for ten of the 118 executed projects has not commenced. Total committed funds for executed projects is the difference between the total funding approved for executed contribution agreements and project expenses incurred to date or contribution agreements cancelled. A summary of these amounts is outlined as follows:

	2018	2017
Total committed funds for executed projects – Beginning of year	\$86,268,397	\$68,379,054
Total funds for executed projects approved or adjusted during the year	\$50,778,397	\$39,543,621
Project expenses incurred during the year	\$(34,084,578)	\$(21,654,278)
Contribution agreements cancelled during the year	\$(7,798,500)	-
Total committed funds for executed projects – End of year	\$95,163,716	\$86,268,397
Total funds for projects approved by the Board	\$90,600,000	\$97,892,765
Total executed and approved commitments	\$185,763,716	\$184,161,162

Funds allocated to the executed contribution agreements are subject to ERA's review and approval prior to disbursement to ensure full compliance with the terms of the contribution agreement. The actual financial commitment could therefore differ materially from \$95,163,716 but will not exceed that amount.

There are also an additional 11 projects, totalling \$90,600,000 (2017 – \$97,892,765), that have been approved for funding by ERA's board of directors but for which contribution agreements have not yet been executed.

Included in the project expenses for the current year is \$nil (2017 – \$527,083) paid to projects being developed in Canada, but outside of Alberta, and \$80,821 (2017 – \$487,341) paid to projects being developed outside of Canada. Included in total executed and approved commitments for the current year is \$16,594,976 (2017 – \$16,594,976) committed to projects being developed in Canada, but outside of Alberta, and \$8,897,476 (2017 – \$9,056,748) committed to projects being developed outside of Canada.

Subsequent to year-end, one of the approved projects, totalling \$10,000,000, has been cancelled, and four of the approved projects, totalling \$23,100,000, have executed contribution agreements. As at September 25, 2018, ERA has six projects remaining, totalling \$57,500,000, that have been approved for funding by ERA's board of directors but for which contribution agreements have not been executed. On September 25, 2018, ERA's board of directors approved a further four projects for funding under the Partnership Intake Program totalling \$11,625,087. ERA has launched the Industrial Efficiency Challenge and the BEST Challenge and has allocated up to \$35 million and \$70 million respectively to fund approved projects under these calls.

ERA indemnifies its directors against claims reasonably incurred and resulting from the performance of their services to ERA. No amounts are reflected in the financial statements related to these indemnifications.

7. Financial instruments

ERA's financial instruments are exposed to certain financial risks, including credit risk, market risk and liquidity risk.

Credit risk

Credit risk is the risk of financial loss to ERA if a party to a financial instrument fails to meet its contractual obligations and arises principally from cash and accounts receivable. The maximum amount of credit risk exposure is limited to the carrying value of the balances disclosed in these financial statements.

Management monitors these accounts regularly and does not believe ERA is exposed to significant credit risk at the statement of financial position date.

Market risk

Market risk is the risk changes in market prices, such as interest rates, will affect ERA's interest income or the value of the financial instruments held. ERA is subject to interest rate cash flow risk arising primarily from fluctuations in interest rates applied to its cash balances, which are subject to floating interest rates.

Liquidity risk

Liquidity risk is the risk ERA will not be able to meet its financial obligations as they come due. Management mitigates liquidity risk by monitoring forecasted and actual cash flows to ensure sufficient liquidity to meet its liabilities. Accounts payable and accrued liabilities are due within the current operating period.

8. Economic dependence

100% of ERA's grant revenue is received from the Fund. The loss of this funding would have a material adverse impact on ERA's operations and financial position. Should a loss of funding occur, all approved project commitments would remain in effect.

9. Reclassification of certain prior year amounts

Certain comparative figures have been reclassified to conform to the current year's financial statement presentation.

CUTTING CARBON.
CUTTING COSTS.

ERA





CUTTING CARBON.
CUTTING COSTS.