



Brooks Solar can now power 3,000 homes

The first utility-scale solar project in Western Canada is generating clean power for the Alberta electricity grid and meeting performance expectations almost one year into operations. Brooks Solar spans 68 acres and includes 48,000 panels. At 17 megawatts, the facility can produce enough power for 3,000 homes.

Live data on how much electricity Brooks Solar is producing can now be accessed from the Alberta Electricity System Operator website. This is the first solar plant to generate enough power to make the list. Over the span of Brooks Solar's 30-year life, emissions reductions of over 400,000 tonnes of CO₂e are expected. And, it's proving to be an example of future possibilities for solar in the province.

"These projects aren't always cut and dry, especially something that's first of a kind. You can't just follow a playbook. It was a team effort: government, third-party contractors, community, ERA, everyone. This project shows that Alberta has all the resources, human and natural, to make projects like this work. Hopefully this is a good motivator," said Jamie Houssian, principal of Elemental Energy, the company responsible for planning, securing financing, and orchestrating construction and permitting of the project.

The Alberta Climate Leadership Plan set a target of 30 per cent renewable energy generated in the province by 2030. While current economics suggest this will largely be achieved by wind power, global trends point toward solar as the long-term choice on costs. ERA is supporting solar projects in parallel with investments in wind power to help Alberta meet and exceed the provincial target.

"Solar has never been done at this scale in Western Canada. Proving that this type of plant can be permitted, contracted, built, and operated in an economically viable manner is a huge step forward," said Chris Owtrim, project specialist, clean technology, ERA.

ERA invested \$15 million to accelerate the development of this \$33 million project. Proactive dissemination of lessons learned from the project—desired location, the preferred community engagement approach, technology, financing, installation techniques, timing—will help inform future solar investments in the province. Learn more on ERA's website.



Imperial project could reduce emissions by 90 per cent

Imperial is evaluating the first commercial application of its breakthrough Cyclic Solvent Process (CSP) following a successful \$100 million, multi-year pilot project at its Cold Lake facility in Alberta. The process could eliminate the use of steam needed in extracting bitumen from oil sands, reducing emissions intensity by up to 90 per cent.

"At Imperial, we are committed to accelerating innovation and developing new technologies that will deliver industry-leading greenhouse gas and economic performance," said Cheryl Trudell, Imperial's vice-president of research. "Through this advanced oil recovery technology, we can significantly improve both environmental and economic performance of our future operations by eventually eliminating the use of steam."

In 2012, Emissions Reduction Alberta (ERA) provided \$10 million to co-fund the demonstration facility. Since 2014, Imperial has been acquiring data, checking viability and gaining operational experience with the technology. Now, researchers are working to confirm commercial opportunities.

"This is a great example of an oil and gas producer finding environmentally sustainable methods to continue to produce resources that we use every day. They are hoping to move the needle by recovering the same resource with

up to 90 per cent less impact in terms of GHG intensity, that's a big win," said Vanessa White, ERA project specialist and director of recovery technologies with Alberta Innovates.

Imperial's research team is leveraging the pilot results and learnings to further understand the feasibility of deploying CSP on a larger scale. The team continues to seek process improvements to deliver additional economic and environmental benefits. Technology development through applied research has been a long-standing focus at Imperial, which established its first oil and gas research department more than 100 years ago. The company is one of the country's only energy producers with dedicated research laboratories focused on advancing oil sands recovery technologies to improve environmental and economic performance.

"Imperial did a lot of work planning the project. They had a strong structure in place from the start that was well thought out. They knew what they needed to learn, they had all the milestones determined, and there have been no major surprises along the way" said Dr. Mark Summers, executive director of technology and innovation with ERA. "It's a project we had every confidence in to succeed. It's a good news story."

COMMITTED TO CLIMATE LEADERSHIP GOALS

- ▶ ERA is a key partner in addressing Alberta's climate leadership and economic priorities. We fund technologies that reduce greenhouse gas (GHG) emissions, and help Alberta build a sustainable economy that attracts investment, creates jobs, expands market access, and delivers improved environmental outcomes.
- ▶ Guided by Alberta's Climate Change Innovation and Technology Framework, our portfolio reflects the policy objectives of the province's Climate Leadership Plan.

CONVENING RESOURCES FOR COLLABORATION

- ▶ The Government of Alberta provides grants to ERA. This funding comes from Alberta's large emitters who choose to pay into the Climate Change and Emissions Management Fund as a compliance option under Alberta's Carbon Competitiveness Incentive program.
- ▶ We work with industry, government, and technology developers to make Alberta a hub for innovative ideas that reduce GHG emissions and improve economic competitiveness.
- ▶ We offer a complete solutions approach to help steward projects toward commercialization. Complete solutions include financing, policy, regulatory, program, and business development tools.
- ▶ With our stakeholders, we developed a Technology Roadmap to guide investment decisions and inform our portfolio mix.

CREATING JOBS AND DIVERSIFYING THE ECONOMY

Technology is the engine of environmental and economic opportunity.



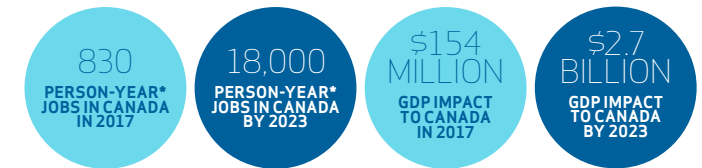
For every ERA dollar we commit to advancing new technologies, more than \$6 has been invested by funding partners.

FUNDING OPPORTUNITY	WHAT'S IT ABOUT?	ERA FUNDING	HIGHLIGHTS
GRAND CHALLENGE	Seeking technologies to transform CO ₂ from waste to value	\$35M	\$10M Grand Challenge winner to be announced in 2019
METHANE CHALLENGE	New methane detection and reduction technologies	\$30M	\$60M total value of projects supported and approximately 60 direct jobs
OIL SANDS INNOVATION	Late-stage, GHG-reducing technologies to help Alberta's oil sands industry remain competitive	\$60M	\$689M total value of projects supported
INDUSTRIAL EFFICIENCY CHALLENGE	Technologies to increase efficiencies for Large Final Emitter (LFE) industrial facilities	\$70M	Project announcement coming soon 93 expressions of interest shortlisted to 19 Full Project Proposal (FPP) applicants
BEST CHALLENGE	Late-stage, GHG-reducing technologies in biotechnology, electricity and sustainable transportation	\$70M	Funding decision spring 2019 180 applications representing more than \$920M in funding requests received. Twenty-four projects submitted FPPs

ALBERTA

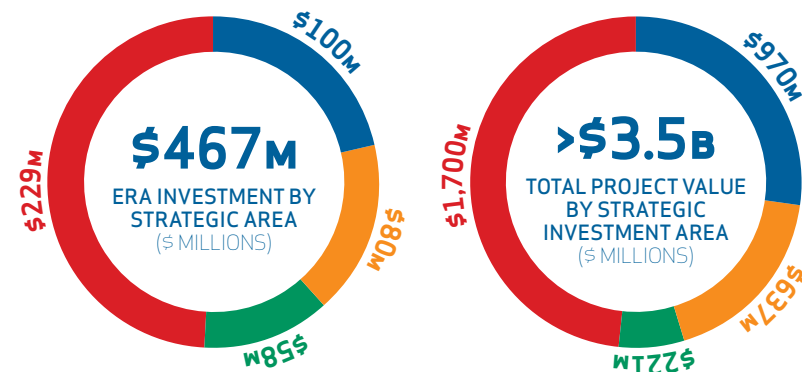


CANADA



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

INVESTING IN A DIVERSE PORTFOLIO



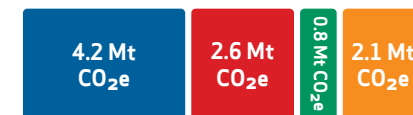
*In 2012, ERA provided funding for three adaptation projects in consultation with Alberta Environment and Water (now Alberta Environment and Parks).

145 Projects Total

- ▶ Low-Emitting Electricity Supply (15 Projects)
- ▶ Reduced GHG Footprint of Fossil Fuel Supply (53 Projects)
- ▶ Industrial Process Efficiency (34 Projects)
- ▶ Biological Resource Optimization* (43 Projects)

CUMULATIVE PROJECT EMISSION REDUCTIONS

9.7 Mt CO₂e Total by 2020



ERA estimates our investments will result in emissions reductions of an average of two million tonnes per year. This is equivalent to reductions achieved by switching approximately 67 million incandescent light bulbs in homes to LEDs, or bringing 507 wind turbines online.

38 Mt CO₂e Total by 2030



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