

Climate Change and
Emissions Management
(CCEMC) Corporation



EVER EXPANDING INNOVATION.

2011/2012 Annual Report



Climate Change and Emissions
Management (CCEMC) Corporation

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MESSAGE FROM THE CHAIR

WE NOW LIVE IN A WORLD WITH SEVEN BILLION PEOPLE.

Our global population will continue to soar in the years ahead, reaching more than 8 billion by 2035.

This tremendous growth is resulting in increased demand for energy and, even as the world continues to develop renewables and enhance energy efficiency, fossil fuels will meet the bulk of the demand.

With the third largest proven oil reserves in the world, this presents a tremendous opportunity for Alberta, but we must continue to demonstrate that we are committed to deal with the obligations that come with responsible resource development. For the CCEMC, this means we must continue to advance investment in renewable energy and carbon capture and storage, encourage energy conservation and efficiency, and reduce greenhouse gas emissions from fossil fuels. Each is equally important if the generations ahead of us are to thrive and prosper.

The CCEMC's success depends on our ability to continuously seek out the best and the brightest ideas, and they come from anywhere. Industry, academic institutions, research organizations and innovators will continue to contribute solutions to our shared global carbon challenge.

The CCEMC has made terrific progress since we began announcing funding for projects, just over two years ago. We have now committed support to a total of 43 projects that will help reduce greenhouse gas emissions by an estimated 8 megatonnes over ten years, which is equivalent to removing about 1.6 million cars from the road. We have also announced support for three adaptation projects and we have launched an initiative to sequester or reduce emissions from biological sources.

It has been a productive year for the CCEMC and we will build on that momentum in the year ahead as we continue to seek out solutions that will help Alberta and the world transition to a lower carbon future.

A handwritten signature in black ink, reading "Eric P. Newell". The signature is written in a cursive style with a prominent loop at the end of the last name.

Eric Newell

Chair, Climate Change and Emissions Management (CCEMC) Corporation

“This is the real prize here, reducing emissions, reducing the cost of the technologies and seeing the businesses behind them grow and prosper.”

- CCEMC Chair Eric Newell, October 2012

BOARD OF DIRECTORS

As an independent, not-for-profit corporation, the CCEMC is governed by a Board of Directors. The Board is responsible for providing leadership, policy development and the allocation of resources to achieve strategic results. The CCEMC Board represents the Public at Large and sectors of the economy that have large final emitters. Together, they provide the CCEMC access to tremendous expertise.



ERIC NEWELL
Chair



DOUG BEEVER
Fertilizer Industry



JIM CARTER
Mineral Manufacturing



PAUL CLARK
Chemical Producers



AARON FALKENBERG
Public at Large



CHARLES FISCHER
Conventional
Oil and Gas



DR. BRENDA KENNY
Pipeline Industry



DR. DAVID LEWIN
Electricity Generation



DR. DAVID LYNCH
Academic



DR. ROBERT MANSELL
Public at Large



PATRICE MERRIN
Public at Large



ROY NEEHALL
Municipal



ALEASA TASKER
Forestry Industry

YEAR AT A GLANCE

During 2011-2012 (June 1, 2011 to May 31, 2012), the CCEMC acted on three Expressions of Interest (EOIs):

- 1. July 2011 - EOI for cleaner energy production and carbon capture and storage projects closed;**
- 2. July 2011 - Small and Medium Enterprises (SMEs) were invited to submit proposals with innovative ideas; and,**
- 3. April 2012 - Energy efficiency projects were invited to submit proposals.**

This year, the CCMEC chose to support 19 projects with innovative approaches to reducing greenhouse gas emissions, the most it has funded in a single year. The 2011-2012 focus was on expanding innovation and demonstrating that big ideas can come from anywhere. The Corporation supported game-changing ideas from small companies; seemingly small-scale ideas with large-scale impacts; and international companies with local solutions. The newly selected projects not only diversify the CCEMC's portfolio, but also spur investment in innovation and transformative technology development.

NEW DIRECTIONS, INNOVATIVE SOLUTIONS

While continuing to fund projects that help reduce emissions, the CCEMC also began to actively address the province's capacity to adapt to climate change. Three adaptation projects are receiving a total of \$7 million and will enhance our understanding of climate change impacts and potential management responses on wildlife, ecosystems, forestry, and importantly, watershed management.

Also new this year, the CCEMC initiated a partnership with Alberta Innovates – Bio Solutions. The Corporation made a commitment of \$8.4 million over three years to discover, develop and deploy solutions that will reduce GHGs from biological sources, such as crop and livestock production, the forest industry and municipal waste handling.



OUR STORY

“It’s encouraging to see that the Climate Change and Emissions Management Fund (CCEMF) has become a critical mechanism to help us drive innovation by focusing investment on reducing emissions at the source. We are not only enhancing Alberta’s competitiveness, we are also striking a balance between environmental protection, economic growth and clean energy development.”

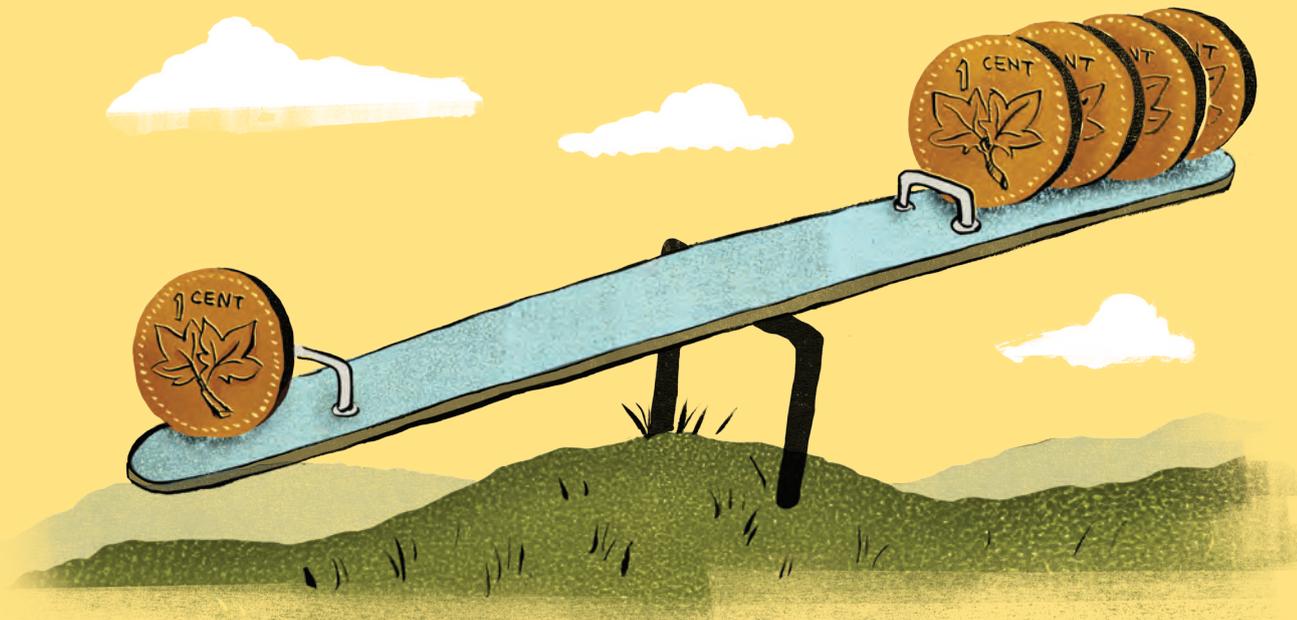
- The Honourable Diana McQueen,
Minister of Environment and Sustainable Resource Development
July 12, 2012

In April 2007, Alberta became the first jurisdiction in North America to pass climate change legislation requiring large emitters to reduce emissions. The CCEMF was created in 2009 to be a key part of Alberta’s climate change strategy and movement toward a stronger and more diverse lower carbon economy. Every year, the Corporation receives a grant from the province of Alberta that reflects the payments from large emitters into the CCEMF. The allocation of these funds is aligned with Alberta’s Climate Change Strategy and includes reducing emissions from fossil fuels, conservation and efficiency projects, and carbon capture and storage (CCS).

Shortly after its inception, the CCEMF initiated its first call for EOIs. Now, three years later, it is funding 43 innovative projects valued at more than \$830 million. In addition, the CCEMF is also now funding three adaptation initiatives and has entered into a partnership to pursue biological projects to reduce emissions.

The CCEMF funded projects are estimated to reduce GHGs by about eight megatonnes over 10 years, not including additional emissions reductions that will occur with broad scale adoption and commercialization.





DIVERSE ORGANIZATIONS, DIVERSE SOLUTIONS

The organizations supported by the CCEMC are diverse and span across the innovation chain from early stage research and development to deployment. There are complex projects led by large organizations, like Imperial and Cenovus, that hold the potential to be the catalyst for further advancement. Then there's small and medium-sized enterprises with big, innovative ideas such as Lancaster Wind Systems whose Chief Executive, Dave McConnell, started an experiment in his garage that has grown into a project that could store electricity generated from wind turbines by compressing nitrogen.

While the CCEMC invests in projects anywhere along the innovation chain, it has tended to favour the demonstration, pre-commercial and commercial stages of deployment to achieve near term GHG reductions. As the Corporation continues to evolve and round out its portfolio, it will make additional investments in early stage research and development. It will also increase its efforts to find the best and the brightest ideas, casting its net as widely as possible to help Alberta and the world find innovative solutions to reduce emissions while addressing the energy needs of our rapidly growing population.

OUR TIMELINE

MAY 6, 2009

Eric Newell named Chair of the CCEMC Board.

JULY 13, 2009

Board of Directors named.

AUGUST 5, 2009

First call for proposals. \$120 million is available.

MAY 2010

Conference Board of Canada releases report on climate-focused technology funds, affirming the CCEMC model.

JUNE 16, 2010

The CCEMC announces \$37.5 million in funding for renewable energy projects.

JUNE 30, 2010

The CCEMC announces \$28.1 million in funding for Carbon Capture and Storage (CCS) and cleaner energy projects.

JUNE 23, 2010

The CCEMC announces \$5.7 million in funding for energy efficiency projects.

JUNE 23, 2010

Second call for proposals with a focus on industrial energy efficiency. \$40 million is available.

SEPTEMBER 30, 2010

Third call for proposals with a focus on renewable energy. \$50 million is available.

DECEMBER 2010

First annual report released.

APRIL 2011

The CCEMC hosts adaptation workshops with government and stakeholder organizations.

APRIL 29, 2011

Fourth call for proposals with a focus on cleaner energy and CCS. \$60 million is available.

FEBRUARY 28, 2011

The CCEMC announces \$27.2 million in funding for industrial energy efficiency projects.

FEBRUARY 16, 2011

The CCEMC announces plans for GHG Reduction Summit.

JANUARY 23, 2012

The CCEMC releases second annual report.

FEBRUARY 6, 2012

The CCEMC releases GHG Reduction Summit Report.

MAY 16-17, 2011

The CCEMC hosts GHG Reduction Summit in Edmonton.

JULY 15, 2011

Fifth call for proposals with a focus on Small-Medium Enterprises (SMEs). \$10 million is available.

APRIL 26, 2012

Sixth call for proposals with a focus on energy efficiency with near term reductions. \$40 million is available.

JUNE 29, 2011

The CCEMC announces \$15 million in funding for renewable energy projects in northern Alberta.

JUNE 21, 2011

The CCEMC announces \$12.65 million for renewable energy projects in southern Alberta.

MAY 10, 2012

The CCEMC announces \$7 million in funding for three adaptation projects.

MAY 14, 2012

The CCEMC announces \$8.4 million in funding to reduce emissions through biological sources, Alberta Innovates – Bio Solutions named as partner.

THE CCEMC GOALS AND RESULTS

In its third year of operations, the CCEMC continued its efforts to fulfill its mission and address its business plan goals. The Corporation uses its goals as benchmarks of success and one way to report its results.

GOAL 1:

To fund clean technology projects that achieve actual and sustainable reductions in GHG emissions.

RESULTS: In the 2011-2012 year, the CCEMC funded 19 projects to achieve reductions in GHG emissions. The Corporation also entered into an agreement with Alberta Innovates-Biological Solutions to support projects to manage emissions from biological sources.

GOAL 2:

To facilitate innovative solutions and the development of transformative technology.

RESULTS: The CCEMC projects reflect the entire innovation chain, from early stage research and development to pilot projects to projects that are near commercialization. To date, the CCEMC has funded six projects in the research and development stage, 11 projects in commercialization, 20 projects in market demonstration, and six projects in technology design and development.

GOAL 3:

To improve the knowledge and understanding of climate change impacts, mitigation strategies, adaptation and technological advancements.

RESULTS: In 2011, the CCEMC completed an inventory of knowledge networks in North America that will help the CCEMC expand climate knowledge. Three reports on biological opportunities were completed. The CCEMC also announced funding for three adaptation projects in 2012.

GOAL 4:

To demonstrate full accountability to all Albertans.

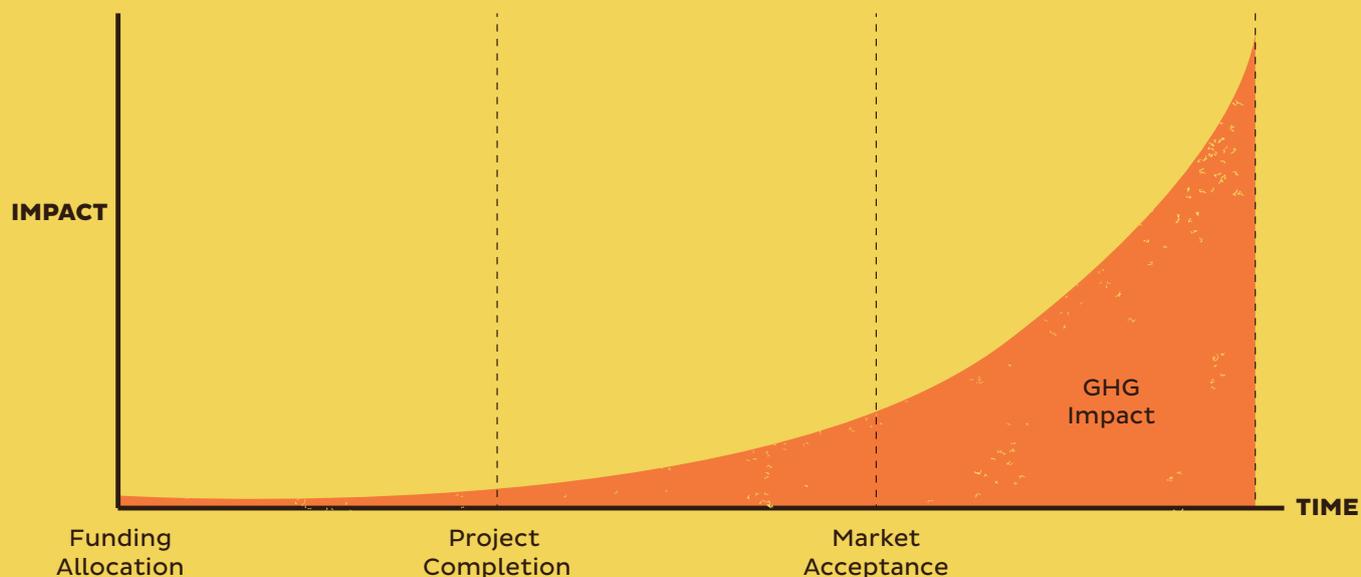
RESULTS: Financial information and performance details are published in this annual report and posted on the website.

REPORTING EMISSIONS REDUCTIONS

Calculating emissions reductions that may result from innovative or untested technology is no small task. It is complicated in part by the fact that there is no single universal standard for calculating emissions reductions. As such, the CCEMC calculates conservative estimates for reduction in greenhouse gases as compared to a business as usual scenario.

The figures the CCEMC releases for emissions reductions reflect emissions at the project level with cumulative reductions over a 10-year period.

INVESTMENT/BENEFIT RELATIONSHIP OF TECHNOLOGY APPLICATIONS



The Corporation seeks transformative technology rather than incremental improvements as a key way to help reduce emissions. Some projects are selected for their ability to reduce emissions through broad commercialization and build-out, but these longer-term greenhouse gas emissions reductions are not factored into the CCEMC estimates.

In fact, some projects that the CCEMC funds, including many CCS projects, produce no emissions reductions over the funding period, but have tremendous potential to stimulate reductions over the long term with commercialization and broad scale adoption and deployment. In addition, the CCEMC projects that are in the early stages of research and development won't deliver reductions in the short term, but help advance innovations that may produce game-changing outcomes.

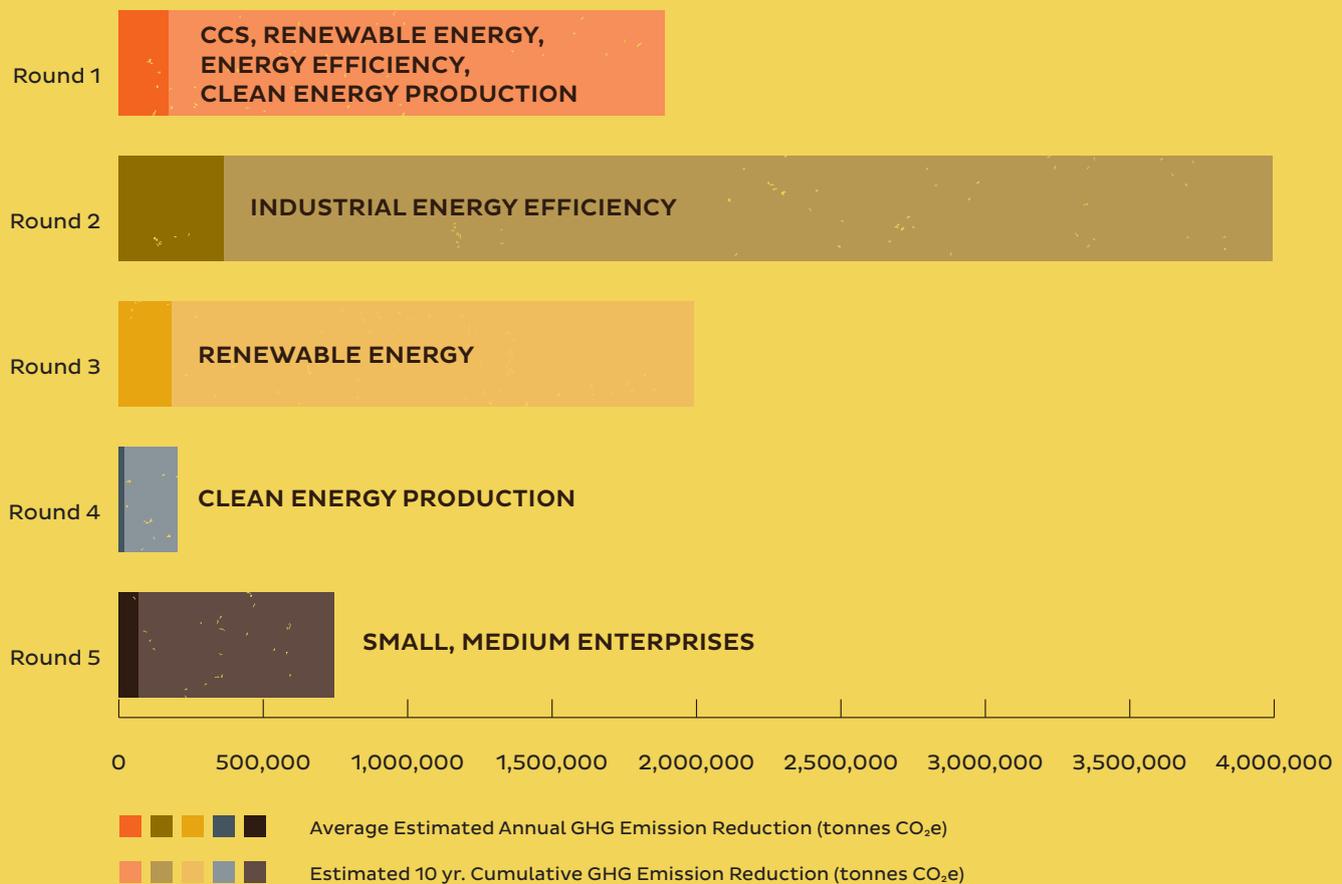
The CCEMC applies a standard methodology to estimate emissions reductions and, as a result, these estimates sometimes differ from those of project proponents. The guidelines for determining GHG emissions are available on the CCEMC website.

Technology takes time to mature. This is especially true for early stage technologies that are transformative in nature. It is these types of investments that are necessary for Alberta to achieve its reduction targets. The sooner we make these investments, the sooner they will mature.

THE CCEMC PERFORMANCE

WE TRACK AND REPORT ON THESE SPECIFIC METRICS:

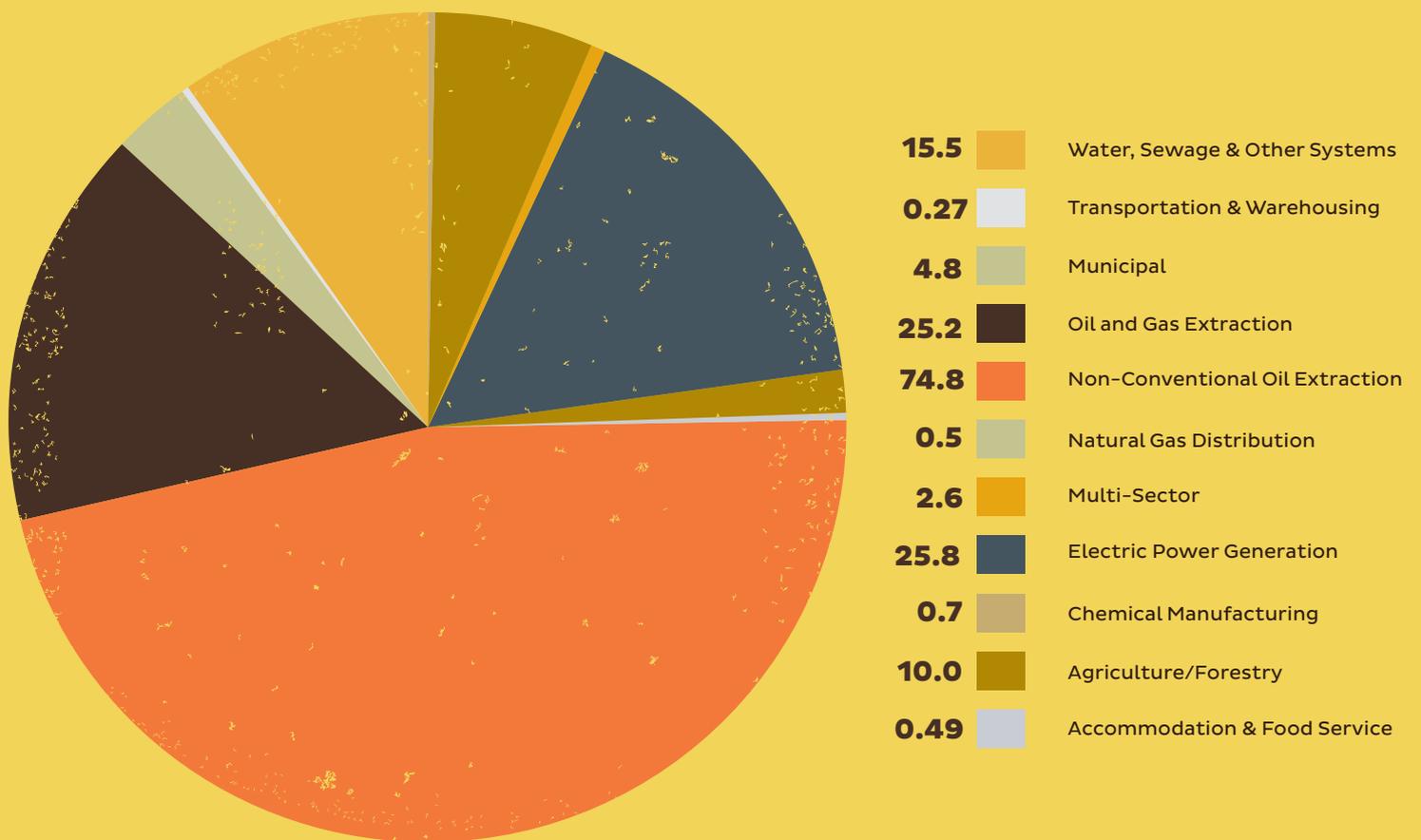
CUMULATIVE EMISSION REDUCTIONS BY CALL FOR PROPOSALS (AVERAGE TONNES CO₂e/YEAR)



GHG REDUCTIONS: THE AMOUNT OF GHG EMISSIONS PREDICTED TO BE REDUCED FROM A BUSINESS-AS-USUAL SCENARIO.

As of May 2012, the CCEMC Board has committed to funding a total of 43 clean technology projects that are conservatively estimated to reduce greenhouse gas emissions by about eight megatonnes over 10 years. Additional reductions are expected through commercialization and broad scale adoption and deployment of these technologies.

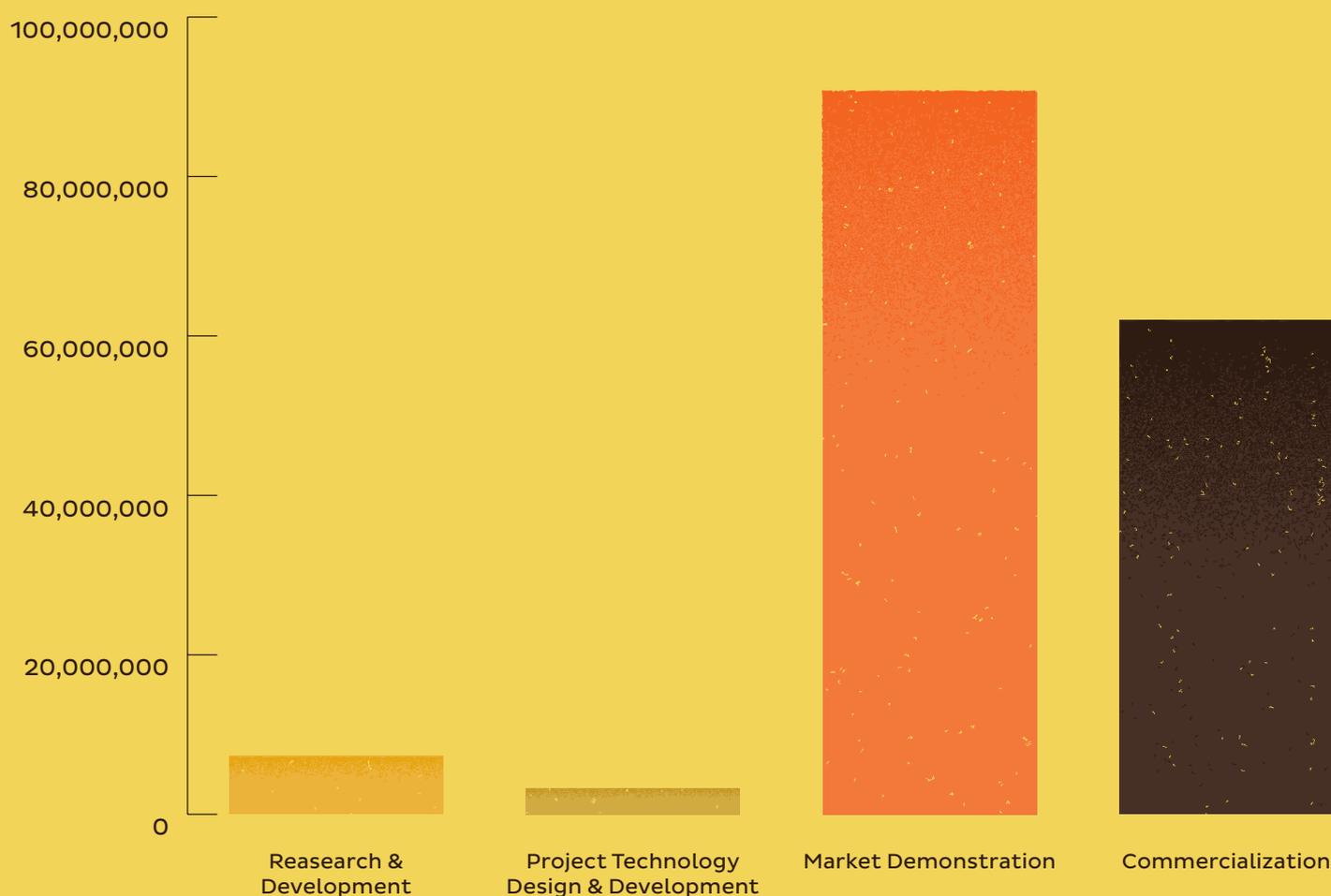
FUNDING BY INDUSTRY SECTOR (IN MILLIONS)



FUND ALLOCATIONS: THE ALLOCATION OF THE CCEMC FUNDS TO SECTORS AND STRATEGIC INVESTMENT AREAS AS WELL AS LEVERAGE ACHIEVED.

By May 31, 2012, the CCEMC had allocated funding to 11 sectors with the bulk of funding targeting non-conventional oil extraction. On average, the CCEMC funds are leveraged 4:1, so for every dollar CCEMC invests, about another four dollars are also invested.

FUNDING BY INNOVATION STEP (IN MILLIONS)



PROJECT SUCCESS: THE STATUS OF SUCCESSFUL, CHALLENGED OR INCOMPLETE PROJECTS, AND THE EXTENT PROJECTS SPAN OR PROGRESS ALONG THE INNOVATION SPECTRUM.

RESULTS: The projects the CCEMC selects to fund have completion forecasts that range from 2-5 years. As of May 2012 – just two years since the Corporation approved its first round of projects – two of the CCEMC funded projects were completed, four projects were more than 40 per cent complete, 10 projects were 20-40 per cent complete and the remainder are in early stages of development.

Three projects that were previously reported as approved have chosen not to proceed at this time. All of the CCEMC statistics, data and financial reports reflect these decisions.

COMPLETED INITIATIVES

AS OF MAY 2012, TWO PROJECTS FUNDED BY THE CCEMC HAVE REACHED COMPLETION.

HTC PUREENERGY

CARBON CAPTURE FEED STUDY

HTC Pureenergy completed process design as well as the Front End Engineering and Design (FEED) study for the Devon Energy CO₂ SAGD capture project. HTC has significant intellectual property related to its modular CO₂ capture technology called the Pureenergy CCS® System.

The completed project will provide a 1,000-tonne/day Pureenergy CCS® System to capture CO₂ from Devon Energy's SAGD boilers at its Jackfish in-situ oil sands developments located near Conklin. This demonstrated that HTC's post-combustion advanced amine CO₂ capture technology can be progressively added to Devon's existing SAGD facilities and integrated into the design of new SAGD boilers. This modular phased approach could be applied across industries in Alberta, and around the world.

EVERGREEN ENERGY TECHNOLOGIES

RELIABLE POWER FOR REMOTE LOCATIONS

Evergreen Energy Technologies is a startup technology company located in Calgary with a focus on the development and commercialization of new technology that will lessen the environmental impact of the energy industry.

Evergreen's completed project uses Power Pod Technology to replace pneumatics – venting devices that waste natural gas and emit GHGs – with hybrid Direct Methanol Fuel Cell (DMFC)/Solar power generation. DMFC allows operators to eliminate gas losses and greenhouse gas emissions from this source.

Power Pod takes advantage of solar energy when it is available, with DMFC providing reliability in winter months. The CCEMC-funded project covered field-testing and market demand evaluation, and supports efforts to bring the technology to commercialization.

A BALANCED APPROACH

PROJECTS SELECTED FOR 2011/2012 FUNDING

ADAPTATION FUNDING

BIOLOGICAL FUNDING

CARBON CAPTURE AND STORAGE FUNDING

CLEANER ENERGY FUNDING

SMALL AND MEDIUM-SIZED ENTERPRISES FUNDING



ADAPTATION FUNDING

The effects of climate change are far-reaching. From our water to our forests, the CCEMC plans to help Alberta reduce climate change impact now and increase our resilience to future effects. With a mandate that includes improving the ability of the province to adapt to climate change, the CCEMC has expanded its reach by providing \$7 million in funding to support three adaptation projects – the first projects of this kind for the Corporation.

GIVING ALBERTA'S TREES A FIGHTING CHANCE



TREE SPECIES ADAPTATION RISK MANAGEMENT PROJECT FOOTHILLS RESEARCH INSTITUTE | \$ 3 MILLION

The question of the impact of weather extremes on forest regions is a challenging one. The CCEMC has provided \$3 million to the Tree Species Adaptation Risk Management Project to explore the answers. The project will see climate variations replicated through strategic plantings at test sites of species from other regions of the province (for example, northern species in southern Alberta). This knowledge is crucial to the province's forest industry as well as the species that depend on forest environments. Led by the Foothills Research Institute and Tree Improvement Alberta, the 3-year project involves a consortium of 13 industry partners, and Alberta Environment and Sustainable Resource Development.

According to Project Manager Daniel Chicoine, "The CCEMC funding is essential since, given the poor financial state of the forest industry, this type of project would never get off the ground. It is vital in preparing Alberta forests for adaptation to climate stressors to ensure healthy forests for future generations. The trials need to be established promptly given the lengthy period required to see how trees respond. Trials would be years down the road without the CCEMC funding."

Chicoine noted: "Forestry needs to be ahead of climate change. In agriculture, some crops can be grown twice a year and learnings can be drawn from this. Forest species take up to 80 years to grow and learnings are much more difficult to obtain. It's important to begin this project and to go beyond our current understandings." The funding will build on the solid work done by Tree Improvement Alberta and expand the range of activities. He continued: "We are excited about the ability to take on questions of how trees will endure, be it a hotter or colder climate."



The normal response to this is negative but the outcomes could be positive for tree growth. In Alberta, we struggle with a short growing season but hotter weather could result in a longer growing season, which could benefit some species.”

Commercially-important tree species are the focus, including Lodgepole and Jack Pines, White and Black Spruces, Trembling Aspen and Black Poplar. Other species that don't normally grow in Alberta, for example, Douglas Fir and Sitka Spruce that grow along the mountain ranges, may also be tested. The project involves an “advanced level of silviculture” and testing of species in a managed environment through trials since the entire forest mass of Alberta cannot be easily measured. The focus is to find families of trees and individual species that show resistance to drought, insect infestation and disease to ensure their survival for the future.

Chicoine observes: “We need to breed trees that can respond to extreme climatic conditions. Trees normally ‘shut down’ to protect themselves: ‘hot and high humidity’ is potentially good but ‘hot and dry’ can be detrimental. We want to find those ‘super trees’ that thrive in extremes as a result of natural adaptation. We are not looking at genetic modification but rather natural adaptation, the ‘predisposition’ in the genetic make-up of some trees that causes them to survive and thrive in adverse conditions. We don’t want to see whole tracts of Crown forests devastated by climate extremes. The way to address this is to study these challenges through natural tree breeding.”

ADAPTATION FUNDING

BIODIVERSITY MANAGEMENT AND CLIMATE CHANGE ADAPTATION

ALBERTA BIODIVERSITY MONITORING INSTITUTE

\$2.4 MILLION

As more becomes known about the effects of climate change, the CCEMC is ensuring Alberta increases its understanding of how our changing climate may be affecting wild species of plants and animals across the province. This collaborative project involves a team of biodiversity scientists and policy analysts from the University of Alberta; Miistakis Institute; Alberta Innovates Technology Futures; the Government of Alberta; and the Alberta Biodiversity Monitoring Institute.

The team will assess hundreds of wild species ranging from prairie flowers to backyard birds and devise proactive strategies for preventing or reducing harm from climate change. The group's findings will expand the data already held by the Alberta Biodiversity Monitoring Institute, which measures and reports on the status and trends of hundreds of species and habitats at permanent terrestrial and wetland monitoring sites across the province.

SOUTH SASKATCHEWAN RIVER BASIN (SSRB) ADAPTATION TO CLIMATE VARIABILITY PROJECT

ALBERTA INNOVATES-ENERGY AND ENVIRONMENT SOLUTIONS/WATERSMART SOLUTIONS LTD.

\$1.6 MILLION

With continuing population and economic growth comes a demand not only for more water but also for improved environmental management. This initiative will assist communities in adapting to existing and future climate variability, while identifying opportunities for environmental improvement and economic growth. It will also explore improvements in water storage and infrastructure, as well as the timing of withdrawals, releases and flows, using an informed, collaborative and adaptive approach to water resource management.

Alberta Innovates-Energy and Environment Solutions (AI-EES) is the lead agency for energy and environmental research and innovation in Alberta, and works to ensure sustainable management of Alberta's water resources. For this project, AI-EES has joined with the non-profit WaterSMART Solutions Ltd. to improve water management through better practices and technologies. Since 2006, WaterSMART has worked collaboratively across industries, communities and watersheds to create implementable solutions for the benefit of the watershed and all stakeholders.



BIOLOGICAL FUNDING

Biological emissions include those from industries vital to the health and economic well-being of Albertans such as crop and livestock production, the forest industry and municipal waste handling. Research has shown that with additional investment to overcome the existing barriers, there is the potential to reduce emissions from biological sources by as much as 23 megatonnes of CO₂e per year. While the estimate may be optimistic, biological sources could make a significant contribution towards Alberta achieving its reduction targets. This year, the CCEMC entered a joint partnership with Alberta Innovates Bio Solutions that will recognize net reductions from biological systems. Alberta has already demonstrated leadership in this area and, with this partnership, could emerge as a global resource for biological GHG emissions reduction strategies.

PARTNERING FOR CHANGE



BIOLOGICAL GREENHOUSE GAS MANAGEMENT PROGRAM ALBERTA INNOVATES BIO SOLUTIONS | \$8.4 MILLION OVER 3 YEARS

While greenhouse gas emissions from the energy industry are well-known, those from crop and livestock production, the forest industry and municipal wastes also offer opportunities for emissions reductions. The CCEMC has committed \$8.4 million over a three-year period for projects aimed at discovering, developing and deploying solutions for biological greenhouse gas emissions in the province. The CCEMC has partnered with Alberta Innovates Bio Solutions, a publicly-funded, board-governed corporation that leads and coordinates science and innovation in Alberta's agriculture, food and forestry sectors, to manage this investment.

Dr. Susan Wood-Bohm, Executive Director, Biological GHG Management Program noted: "By providing essential core funding through a unique program, the CCEMC is catalyzing the financial and strategic partnerships that will generate innovative, economically-sound, real-world solutions for bio-sourced emissions. The potential to reduce emissions from biological sources in Alberta is very significant (up to 23Mt CO₂e/yr), but scientific, technological and market-place barriers currently block our ability to achieve these reductions. The investment by the CCEMC supports projects that improve fundamental understanding, overcome technological hurdles and demonstrate strategies. Ultimately, the work will lead to verifiable reductions in GHGs from agriculture, forestry, and landfills, enhanced capture of atmospheric carbon for long-term storage, and increased use of biological materials."

The projects to be funded must result in emission reductions, improve long-term carbon storage, or find new ways to use biological materials. Examples could include reducing methane emissions from livestock in feedlot operations, or reducing the nitrous oxides associated with fertilizer applications to cropland. In forestry operations, new ways to use harvest residue for their emission-reduction potential will be explored. While some dead trees, branches and stumps provide homes for wildlife and keep soils healthy, some could be used to create new products such as biochar. This carbon product is produced from the thermochemical decomposition of organic material and



could replace vermiculite in potting media or even be used as a filtering device to clean water in Steam Assisted Gravity Drainage oil sands extraction, all while reducing GHG emissions.

While reducing waste and improving best management practices will go a long way, the scale of the problem requires transformational discoveries and ways of doing business. An example could be drawn from the construction industry, which relies on steel and concrete. The production of both generates large GHG emissions. Alternatively, timber and modern wood laminates could substitute for at least some of these construction inputs, prompting other provinces to reconsider multi-story building codes and encourage better use of wood resources.

According to Wood-Bohm, the real power of biological systems is the ability to store carbon from the atmosphere. Through the process of photosynthesis, plants are able to take carbon out of the air and store it in trees, roots and soil. And Alberta has a huge natural endowment of forests, rangeland and croplands. Improvements in the amount of CO₂ taken up, or the length of time that it is stored would have a huge impact on overall atmospheric concentrations.

How to pick the projects to fund? Wood-Bohm notes that they will focus on projects with the potential for large-scale impact: "For the atmosphere to notice, the projects must ultimately help to deliver megatonne-scale emission reductions." Demonstration-style projects with multiple partners are expected to deliver the knowledge and refinements that will lead to implementation of new technologies.

Alberta is especially well-positioned to be successful in this area, with a wealth of expertise in local industries, regional government and Campus Alberta. These partners and other stakeholders will be invited to bring their knowledge and skills to the projects, and to collaborate in transferring new technologies from academic labs to industry applications.

“Since there’s not very good visibility on CO₂ regulations yet, industry and investors are hesitant to put up a lot of risk money in that area right now. In our case, this project would not go ahead without the CCEMC’s support.”

- Inventys co-founder Brett Henkel, July 2012

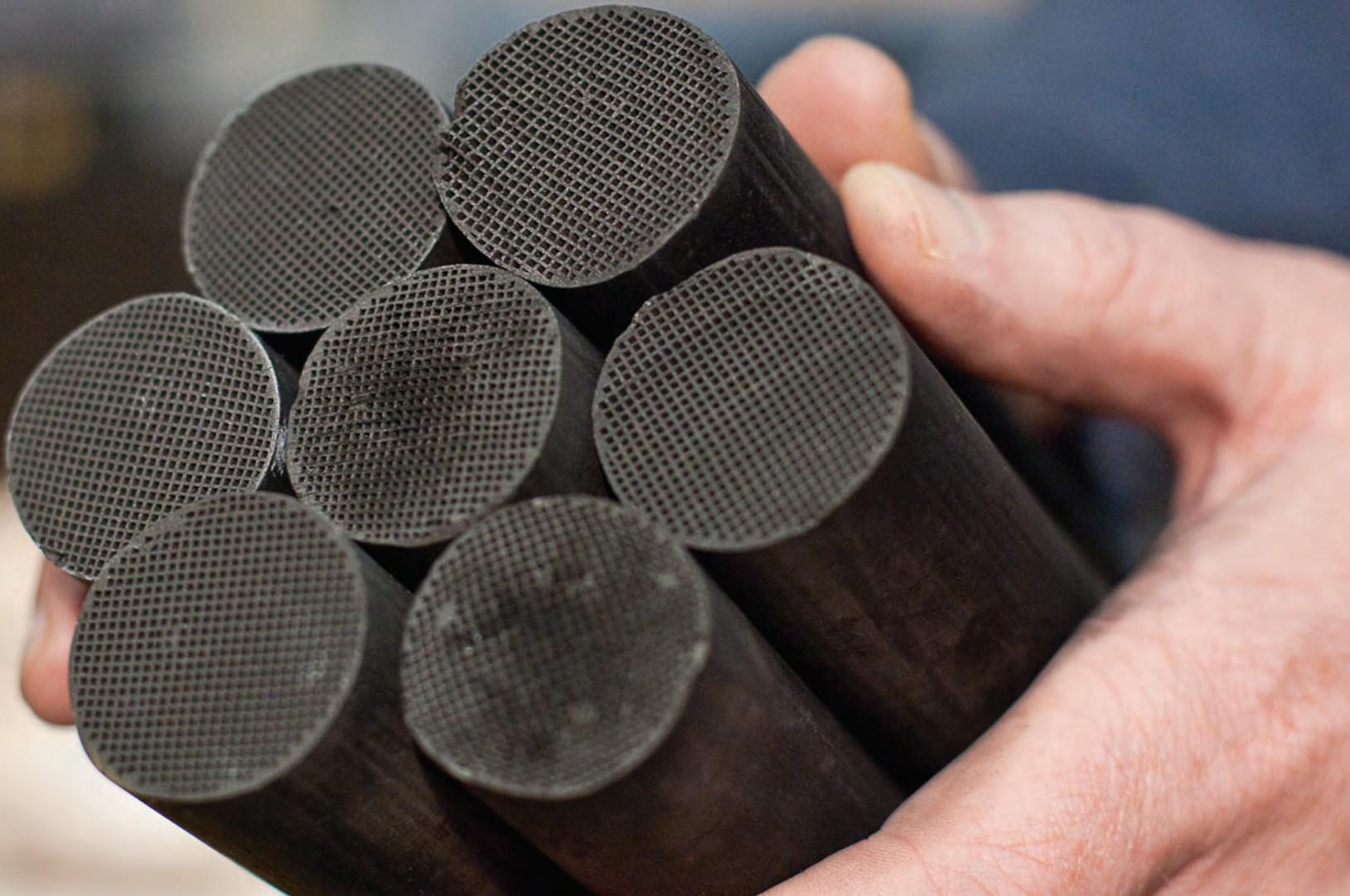


CARBON CAPTURE AND STORAGE FUNDING

For Alberta to continue as a global energy supplier, the CCEMC recognizes the important role of carbon capture and storage – the process that captures carbon dioxide emissions and stores them permanently in geological formations deep underground. This method is particularly suited for our province because the geology that has made Alberta a successful energy supplier is the same geology needed for safe and effective carbon capture and storage.

Several carbon capture technologies hold tremendous potential. This year, the CCEMC has provided funding to three innovative carbon capture and storage projects that will help make the potential benefit a reality.

A SIMPLE SOLUTION WITH LARGE SCALE IMPACT



VELOXOTHERM™ CO₂ CAPTURE PROJECT AT JOFFRE INVENTYS THERMAL TECHNOLOGIES INC. | \$3 MILLION

“Carbon dioxide can be captured, and it can be done in many ways,” said Brett Henkel, vice president of Burnaby-based technology firm Inventys. Indeed, industrial processes to extract carbon from gas streams have been around for 50 or 60 years. “It’s just that we developed a more effective way to do it. The system we have created has a smaller footprint and it’s more energy-efficient. It doesn’t use liquid solvents, so the environmental impact of dealing with these chemicals is simply not there. Our system is simply a better way to capture carbon.”

His company has patented the process as VeloxoTherm, and the CCEMC is funding half of a \$6 million technology demonstration project in Joffre, Alberta. The project will capture emissions from a natural gas powered steam boiler at a Nova Chemical’s petrochemical plant.

Like many other systems, Inventys uses an adsorbent, the material that grabs onto the gases. But, Henkel notes, “We changed the structure of the adsorbent and made it particularly useful for flue gases.” The process uses a capital- and energy-efficient rotary adsorption technology. If you could look under the steel skin of the Inventys system, according to Henkel, “you would see a large wheel made of adsorbent that turns about one revolution per minute. On one side of the wheel, the spokes collect carbon dioxide; on the other side, those spokes come into contact with counter-current steam, which releases the CO₂.” Though building its first facility, the company is still in the technology-development and demonstration stage, with the CCEMC as its key partner.

To make the demonstration more economic, Inventys intends to supply CO₂ to oil company PennWest, which has been using CO₂ for an enhanced-oil-recovery flood operation for 30 years. “They want to buy more CO₂, and that



is now the market we are going after,” according to Henkel, adding that the system enables CO₂ capture at a cost that “unlocks lucrative opportunities including enhanced oil recovery.” He estimates that the commercial system will capture 90% of the CO₂ present.

When Inventys went into business in 2007, there was some momentum among governments to regulate carbon emissions. It seemed that, with emissions regulations on the horizon, there would be a great deal of demand for systems that could capture carbon emissions so they could be safely stored underground in a system known as carbon capture and storage (CCS). Inventys’ four founders, whose goal was to commercialize lowest-cost and most energy-efficient technology for capturing post-combustion CO₂ from industrial flue gas streams, believed they would eventually dominate the market.

However, first the United States and then Canada abandoned plans for regulating carbon dioxide, so it was time for a change of business model. According to Henkel, “the changed policy environment made it difficult for our company to do business just by using our technology to extract CO₂ for carbon storage. So, we switched our business model. We are now focused on using CO₂ for enhanced oil recovery rather than CCS. The system we are constructing will extract inexpensive carbon dioxide for the oil recovery industry.”

Henkel remains optimistic that the Inventys system will contribute to CCS as well, and will soon sign a contract with a British company to do so. That arrangement is a direct outcome of its partnership with the CCEMC.

CARBON CAPTURE AND STORAGE FUNDING

CHEMICAL LOOPING STEAM GENERATOR – 10 MW PILOT

CENOVUS ENERGY INC.

\$10 MILLION

With the help of the CCEMC, Cenovus Energy's chemical looping steam generator will be the world's first and largest field pilot that uses chemical looping combustion (CLC) technology to generate steam in the oil sands. CLC is considered energy efficient because one of the flue's exit gases can be released with minimal CO₂, but it is also considered a carbon capture technique because almost all of the CO₂ generated by the system is contained in the other flue. This project will lower the cost of capture when compared to a conventional steam generator with post-combustion carbon capture.

The goal of this project is to prove that chemical looping technology is a commercial option for steam generation in the oil sands. If the pilot is successful, Cenovus anticipates this technology could be further deployed in Alberta and result in significant emission reductions of approximately 1 megatonne of CO₂ equivalent over 10 years.

LASHBURN CO₂ CAPTURE DEMONSTRATION PROJECT

HUSKY ENERGY

\$3.0 MILLION

Husky Energy is one of Canada's largest integrated energy companies and looks for new innovations to reduce greenhouse gas emissions in its projects. Husky is now looking at a CCEMC-supported project that has the potential to reduce greenhouse gas emissions by capturing carbon dioxide produced from a steam assisted gravity drainage facility and storing it at a nearby oil production field.

By integrating new process equipment with existing infrastructure, the aim of the project is to capture approximately 35 tonnes of CO₂ a day from a steam generator, transport it by pipeline to an existing compression facility, and inject it into a partially depleted oil reservoir. If successful, the project may provide an opportunity for use in larger applications in Alberta. The advancement of the project is contingent on securing additional funding participants, as well as final company and regulatory approvals. If successful, the application of this technology in Alberta could result in significant reductions of approximately 1 megatonne by 2021.



CLEANER ENERGY FUNDING

Supporting industry efforts to reduce emissions from fossil fuels will help sustain Alberta's role as a global energy leader, even as we transition to other sources. The need to maintain momentum is pressing. It takes 20 to 30 years to bring new technology to market in the resource sector – much longer than in other sectors. To help find balance between Alberta's prosperous economy and a lower carbon economy, the CCEMC is actively addressing challenges facing Alberta's large emitters. This year, the CCEMC is funding three cleaner energy projects that have tremendous potential to reduce Alberta's GHG emissions over the long term.

THE OIL SANDS INCONGRUITY



CYCLIC SOLVENT PROCESS PILOT IMPERIAL OIL | \$10 MILLION

The oil sands incongruity – low-quality oil in high-quality sand reservoirs – is the main reason bitumen production is so high in greenhouse gas emissions. But now, Imperial Oil may have developed “a game-changing technology that would eliminate the need for water and, therefore, the need to burn natural gas to generate steam. Therein lies the reduction of greenhouse gases,” according to Imperial Oil spokesman Pius Rolheiser. In this game-changer, CCEMC is in centre court.

Scientists, tinkerers and business people for a hundred years have considered heat from burning oil or gas as an essential ingredient for extracting bitumen from the oil sands. Heat liquefies the bitumen, which in its natural state has the consistency of cold molasses. Deeply-buried bitumen treated in this way can be pumped from the ground for processing into consumer products such as gasoline and industrial fuels like diesel.

Canada’s oldest and second-largest petroleum company, Imperial Oil has long been the leader in releasing oil from Alberta’s vast Cold Lake oil sands deposit. The company began experimenting there in the early 1960s, injecting steam into the reservoir to draw the oil to the surface.

In order to generate steam, natural gas must be burned – and that releases CO₂. The CCEMC is now investing in a large-scale demonstration project that could help find a solution to this GHG problem. To go into operation next



year, the Cyclic Solvent Process (CSP) three-year pilot at Cold Lake will use three horizontal wells and cost \$100 million. The CCEMC will contribute 10% of the total.

From a business perspective, CSP has the advantage that it will increase the bounty of the Cold Lake oil sands deposit. Despite numerous improvements over the years to the Carbon Capture and Storage (CCS) technology used at the Imperial project, the company still recovers only 30% to 40% of the oil in place. “With the application of solvents and some other follow-up processes,” said Rolheiser, “we think we can take that to the 50-60% range.” After the bitumen has been produced, the solvent will be recovered and reused... if everything goes according to plan.

Like most good science, the Imperial project is the product of many years of lab work and experiment. According to Rolheiser, “Imperial Oil has been working on CSP technology in the lab since 1993. It takes years to advance this kind of technology. The purpose of the pilot is to determine whether it’s feasible to inject just solvent, or whether a small amount of steam is required. We are also looking for the best methods of recovering solvent, and the best solvent to use.”

CLEANER ENERGY FUNDING

HI-Q™ HEAVY CRUDE QUALITY IMPROVEMENT

MEG ENERGY CORP.

\$10 MILLION

MEG, a publicly-traded oil sands energy company, is developing an innovative process to efficiently convert bitumen into a crude oil suitable for transport by pipeline without the requirement for diluting agents. A unique combination of mild-intensity processes is applied to the bitumen, resulting in high yields and a reduction in greenhouse gas emissions associated with conventional upgrading. By eliminating the need for light hydrocarbon diluting agents, the process also effectively increases the product volume that can be transported through existing pipeline infrastructure.

Should this project be successful, the emission reduction from the application of this technology could result in the reduction of 1 megatonne of CO₂ equivalent, compared to currently standard conversion processes, over the next ten years.

N-SOLV BEST PILOT PLANT AT SUNCOR DOVER

N-SOLV CORPORATION

\$10 MILLION

The BEST (Bitumen Extraction Solvent Technology) Pilot Plant will demonstrate N-Solv technology at field scale and is the result of collaboration between N-Solv Corporation and Suncor Energy, with support from Sustainable Development Technology Canada (SDTC).

N-Solv's technology has the potential to reduce greenhouse gas (GHG) emissions associated with insitu extraction by 42,000 tonnes of CO₂e by 2015, and 12,000,000 tonnes by 2012, given present rates of technology adaption.

Suncor's Dover lease in Athabasca is the host site for the 500 barrel-per-day facility, comprising a 300 metre horizontal well pair and a surface plant for processing produced hydrocarbons. The N-Solv process uses the proven horizontal well technology developed for the steam-assisted gravity drainage process, but differs significantly in that it does not use any water. Instead, N-Solv uses warm propane or butane, which is injected as a vapor, and condenses underground, washing the valuable compounds out of the bitumen. The science of the N-Solv process has been validated at the laboratory scale and now requires field piloting in order to demonstrate commercial readiness. The process is expected to produce a lighter, partially upgraded, and hence, more valuable, oil product and may recover more resource from each well at lower capital and operating costs than existing in-situ processes.

The GHG benefits associated with the technology are derived from two sources: extraction emissions (those associated with liberating oil from the ground) and from a significant reduction in downstream upgrading requirements (and consequently, energy consumption). Construction of the BEST pilot began in early May 2012 and is scheduled for completion by December 2012. Solvent injection and first oil production is expected for the second quarter of 2013.



SMALL AND MEDIUM-SIZED ENTERPRISES FUNDING

The CCEMC knows that small and medium-sized businesses (SMEs) are historically very strong innovators but can often find it difficult to access the capital required to advance their technologies. Although small in size, the companies receiving funding offer the potential of big solutions to even bigger issues. The 13 projects selected for funding come from a range of different SMEs and will help reduce GHG emissions in Alberta while supporting our transition to a lower carbon economy.

BUILDING THE FUTURE



NET ZERO (READY) HOME DESIGN AND DEMONSTRATION FOR PRODUCTION HOUSING LANDMARK GROUP OF BUILDERS | \$499,200

Homeowners consume 19% of the natural gas and 16% of electricity used by Albertans¹. Even small improvements to energy efficiency could mean big reductions in greenhouse gas emissions. In the case of new homes, total improvements can represent as much as 40% of the total.

Government incentives to retrofit older homes are beneficial, but the best way to create energy-efficient houses is to build them that way. The Alberta-based, residential construction company, Landmark Group of Builders, is leading the way. And by partially-funding a Landmark NetZero Home demonstration project, the CCEMC is helping consumers make better choices about low-carbon residential systems. Dr. Haitao Yu, chief researcher for Landmark, indicated that benefits accruing from this funding will be improved market affordability of their NetZero Homes for mainstream housing; sharing of solutions with other Alberta homebuilders; and movement of the market diffusion point of NetZero Homes ahead by at least five years.

Landmark achieves NetZero status by focusing on three elements: making the house “envelope” as energy-efficient as possible; using the most energy-efficient equipment and appliances; and generating energy through the use of photovoltaic (PV) cells, i.e., solar panels. Landmark has focused on energy-efficient home construction for about five years, building more than 700 such homes, mostly in Edmonton. Low-cost features such as high energy-efficient furnaces, heat recovery ventilator (HRV) and triple-glazed low-e windows ensure lower carbon emissions.

¹ <http://www.centreforenergy.com/FactsStats/statistics.asp?template=5,2>



Yu notes: “We see our homes as a system, and from the time we start to build the envelope everything we do is energy-efficient. We use spray foam insulation instead of fiberglass. We carefully choose the dishwasher and refrigerator we install. Houses we build consume 40% less energy than other new houses so the average homeowner can save \$500 or more each year on utilities.” Savings on that scale can offset higher mortgage payments. This makes energy efficiency a wise investment – since the cost of upgrading to one of these more energy efficient homes is \$10,000 or less.

In March, 2012, Landmark Group of Builders held a demonstration project involving the assembly of their first NetZero show home in Cranston, a new Calgary subdivision. The project, a partnership with Brookfield Residential Properties, will see the construction of 27 sustainably-built, energy efficient homes – the first community of its kind in Alberta. The homes will have Built Green Platinum status, one of the highest green building ratings. The Calgary project has larger home models (2,400 square feet, \$600,000 plus) but Landmark wants to provide purchasers with a wider range of housing types. Dr. Yu acknowledged that buyers presently pay a premium for such homes and would like to see NetZero homes available for as little as \$270,000.

Each home will have 50 solar panels and the design conforms to homes in typical upscale Calgary neighbourhoods. The homes will be connected to the Alberta electrical grid and will both unload and upload electricity as necessary. These houses will each generate 14,000 kWh of electricity annually, which translates into reduced carbon dioxide emissions of about 140 tonnes per year.

SMALL AND MEDIUM-SIZED ENTERPRISES FUNDING

DIRECT AIR CAPTURE – PILOT PLANT DEMONSTRATION

CARBON ENGINEERING LTD.

\$499,901

Carbon Engineering Ltd. (CE), was founded to design and commercialize technology to cost-effectively capture carbon dioxide directly from the atmosphere at industrial scale. Direct air capture of CO₂ enables large facilities to manage emissions from any source or location so that industrial economies of scale can be applied to the large fraction of emissions that come from distributed and mobile sources such as vehicles, airplanes, and buildings. CE's air-capture process is likely to be profitable under current and emerging legislation on CO₂ emissions in specific markets, such as that under California's Low Carbon Fuel Standard. CE's technology can serve to provide CO₂ for enhanced oil recovery, which creates high-value low carbon-intensity liquid fuels. CE was founded in 2009, is based in Calgary, and currently has 11 employees.

CE has recently completed research and development and proof-of-concept phases for their direct air capture technology. CE is now moving to build and operate a small-scale commercial pilot plant within the next three years, which will process atmospheric air and provide pure pipeline-quality CO₂ to an industrial consumer. This pilot plant will be a key enabling step in driving the technology towards deployment-readiness, where there is enormous potential to reduce emissions from sectors that are currently proving costly or difficult from which to mitigate.

OPTIMIZATION OF ENZYMATIC SYSTEM FOR CO₂ CAPTURE FROM OIL SANDS PRODUCTION

CO₂ SOLUTIONS INC.

\$500,000

CO₂ Solutions Inc. is an innovator in the field of enzyme-enabled carbon capture and has been actively working to develop and commercialize a technology for stationary sources of carbon pollution. The technology will lower the cost barrier to Carbon Capture, Sequestration and Utilization (CCSU), and would position CCSU as a viable CO₂ mitigation tool, as well as enabling industry to derive profitable new products from these emissions.

For this project, CO₂ Solutions Inc. will work with a major Alberta oil sands producer to optimize its technology for low-cost carbon capture from natural gas combustion emissions. The one-year project will prepare the technology for pilot testing at an oil sands site in the province. The technology is based on the use of an enzyme, carbonic anhydrase (CA) that functions in humans for the management of CO₂ during respiration. When introduced in a packed tower scrubbing system, the CA technology substantially improves CO₂ capture efficiency with low-energy solvents. The technology has strong potential as an economic solution for the large-scale reduction of CO₂ emissions in Alberta, particularly from in-situ oil sands operations.

HIGH EFFICIENCY ENGINE PROJECT

E3P TECHNOLOGIES INC.

\$500,000

In Alberta's oil and gas industry, large gas compressor engines burn approximately 60% of the total fuel gas used, emitting 11.9 megatonnes a year of CO₂ equivalent. E3P Technologies Inc. is developing a revolutionary engine that can reduce GHG emissions by up to 50% and diversify the Alberta manufacturing industry. This project will see the initial development of this 100 horsepower (hp) high-efficiency engine as part of multi-year project.

The project will use the E3P-developed CvRTM, a rotary positive displacement platform technology, and a Pulse Detonation Combustor (PDC) that operates with a supersonic detonation of fuel at constant volume, resulting in high peak pressures and double the efficiency of an internal combustion engine. A CvRTM compressor and expander will be combined with a PDC to create a high efficiency engine with 1/5 the weight and size of a conventional large hp engine.

The advancement of the project is contingent on securing additional funding participants, as well as final company and regulatory approvals.

STACK-TOP TEMPERATURE REDUCTION PROJECT

GLOBAL ANALYZER SYSTEMS LTD.

\$300,000

Global Analyzer Systems provides Alberta's energy producers with equipment including state of the art, multi-component Continuous Emission Monitoring Systems (CEMS), Data Acquisition and Control Systems, CEMS Online Reporting, Quality Assurance Plans and Compliance Auditing. Global continues to be a trusted source for CEMS support and regulatory compliance and provides high quality, custom built CEMS solutions for a variety of industries that demand efficient and accurate emission reporting.

This project will use the new TRS-CEMs technology and will enable sulphur recovery units (SRUs) in Alberta, and globally, to reduce stack top temperatures while still meeting Alberta Environment's emission guidelines. The innovation advancement builds upon Global Analyzer's existing CEMS sampling technology to allow for continuous TRS measurement in high temperature incinerator stacks – a technology not currently available. This is an innovative product as it will significantly simplify the process and requirements for reducing the stack top temperatures of sulphur recovery unit incinerator stacks, which directly translates to a reduction in energy consumption as well as lower emission rates of GHGs.

**ENGINEERING OF THE NATURAL GAS DUAL FUEL BLEND SYSTEM
FOR HEAVY DUTY DIESEL VEHICLES**

HI-TEC FUEL AND AUTO LTD.

\$274,218

Hi-Tec Fuel and Auto Ltd. has a long history of innovative fleet solutions, including natural gas conversions, upfitting, maintenance and repair. Hoping to add to their successes, this project will use a dual fuel technology, a conversion technology system, and add it to an existing heavy-duty (HD) vehicle diesel engine, enabling the HD diesel engine to operate on a high proportion of natural gas blend. Potentially, up to 60% (or greater) of the diesel fuel can be substituted with compressed natural gas (CNG) when utilizing the Hitec dual fuel technology. CNG, the cleanest of all the fossil fuels, contains less carbon than diesel, therefore producing lower CO₂ emissions per vehicle mile travelled.

Installing the Hitec dual fuel system in HD vehicle engines throughout Alberta and Canada will produce tangible, long-term, and sustainable CO₂ emission reductions. Additionally, the technology is expected to provide added operational benefits by reducing heavy-duty vehicle fuels costs and boosting engine power. Based on the nature of this project, there will be no emissions reductions until the technology moves to the commercialization stage.

**ENERGY EFFICIENT MEMBRANE REFINING OLEFINS
FOR THE PETROCHEMICAL INDUSTRY**

IMTEX MEMBRANES CORP.

\$500,000

Many attempts have been made over time to develop alternative separations technologies for refining olefin gases from olefin-paraffin mixtures in the petrochemical industry. Conventional means of achieving these separations are various distillation processes, which have been proven to be highly energy intensive. And none have proven to deliver the sustainable and stable separation performance necessary for these applications.

The Imtex Membranes Corp. project will demonstrate the effectiveness of achieving these separations using a unique Imtex-developed membrane technology in a hybrid form with existing technology or as a standalone solution. This will result in a drastic reduction in the energy used and an equally significant reduction in GHG emissions. The demonstration will include pilot plant deployment and testing at an operational petrochemical plant site in Alberta. The applications to be demonstrated will include the separation of ethylene from ethane-ethylene mixtures, propylene from propane-propylene mixtures and the separation of butenes from butanes-butenes mixtures.

Based on the nature of this demonstration project, there will be no emissions reductions until the technology moves to the commercialization stage.

LWS ENERGY STORAGE SOLUTION PILOT PROJECT

LANCASTER WIND SYSTEMS INC.

\$500,000

Currently, electricity is transferred in a closed circuit and cannot be stored, requiring us to use what we produce. Therefore, even though power plants seemingly generate all of the energy we need, any changes in demand cannot be accommodated without reducing demand elsewhere.

Lancaster Wind Systems Inc. (LWS) has developed an energy storage solution that allows electrical energy to be stored and then released when required. This solution will control energy produced from renewable sources such as wind and solar and supply base load energy to the grid, thus allowing the replacement of non-renewable energy sources. The LWS system consists of three closed loop systems. The systems use hydraulic pressure to store energy as high-pressurized nitrogen for conversion back to hydraulic energy and then electrical energy through hydraulic motors and generators.

The LWS Energy Storage Solution Pilot Project will construct and test a prototype of the LWS energy solution in Nisku, Alberta. The prototype has already been commissioned and the Pilot project is the next phase of development. The Pilot project will store energy as compressed nitrogen gas for future use. Without energy storage, uncontrollable renewable sources of energy such as wind and solar cannot be a replacement for conventional non-renewable energy sources.

Based on the nature of this pilot project, there will be no emissions reductions until the technology moves to the commercialization stage.

PUMP JACK OPTIMIZATION AND GHG REDUCTION USING BEST AVAILABLE TECHNOLOGY

PAHL'S PREVENTATIVE MAINTENANCE CORP.

\$443,223

This project will demonstrate the environmental, operating and economic benefits of upgrading existing pump jacks with best available technology to reduce GHG emissions.

Fuel gas consumption and GHG emissions will be measured at six units before and after optimization and installation of new state-of-the art control devices. The improvements will be documented and shared with government and industry.

The project brings together technology from other jurisdictions and local expertise and shared in a novel manner that will encourage uptake by industry. The advantages include increased oil sales, lower water disposal costs, and lower maintenance costs. The benefits include GHG emission reductions.

REGIONAL MUNICIPALITY OF WOOD BUFFALO AEROBIC LANDFILL PROJECT

SALT CANADA INC.

\$500,000

SALT Canada Inc. was created to environmentally and economically improve the process of landfilling municipal solid waste by rapidly eliminating methane production potential, protecting groundwater against contamination and providing a platform for landfill material recovery and reuse while providing lowest life-cycle costs.

This project may be the largest landfill carbon reduction project in the world and the single largest carbon offset project in Alberta, to date. It will be achieved by drastically transforming the Fort McMurray aerobic landfill from an anaerobic state to an aerobic condition through the injection of compressed air throughout the site. The anaerobic bacteria that produce methane will perish in the presence of the oxygen contained within the compressed air. Aerobic bacteria will quickly and naturally replace the anaerobic bacteria and produce no methane, all while transforming the organic material into a “compost-like” material about 30 times faster than the anaerobic bacteria.

The entire process of decomposition will typically be completed in about four years as opposed to over 100 years under traditional technologies.

LOW ENERGY PRODUCED WATER TREATMENT

SALTWORKS TECHNOLOGIES INC.

\$500,000

As a clean tech company, Saltworks Technologies Inc. (Saltworks) delivers innovative solutions for desalination and water treatment – and this project is no different. With the CCEMC funding, Saltworks will develop and test a robust waste heat driven desalination technology intended for treating highly impaired waters in the Albertan oil sands industry. The technology uses waste heat, which is abundant in the oil sands, to produce freshwater from Steam Assisted Gravity Drainage (SAGD) blowdown water. The results are reduced wastewater discharge, reduced freshwater withdrawal, and reduced emissions compared to conventional treatment technologies.

The project work will be completed at Saltworks’ fully permitted Vancouver facility. The focus of the project is to confirm technical and economic feasibility on real SAGD blowdown water while preparing for future scale-up and roll-out. The project is structured to accelerate commercialization by inclusion of industry partners and a field ready unit for operation on an active oil sands facility following the completion of the project.

**PERMANENT SEALING OF GHG EMITTING OF SEQUESTRATION
WELLS WITH A BISMUTH-BASED METAL ALLOY**

SEAL WELL INC.

\$500,000

Traditional cementing procedures for repairing or abandoning oil and gas wells that leak GHG emissions are unreliable and, according to some, even futile. This can especially be the case if cement is used to seal GHG sequestration wells. This is because of the fundamental chemical and physical properties and processes that attend the setting of cement, as well as the long term deteriorating effects of reservoir fluids that come in contact with it.

Seal Well Inc. is actively commercializing its proprietary well sealing technology that is set to solve these issues. The company has developed proprietary plugs and procedures to replace cement that are more effective, reliable, and less expensive. The CCEMC funded project is intended to demonstrate that permanent sealing of GHG emitting wells, including and especially those that penetrate CO₂ sequestration reservoirs, can be reliably, economically, and permanently accomplished by utilizing a low melting point bismuth alloy molded in situ, as the well casing and cemented annulus sealing material.

CRYOGENIC CARBON CAPTURE WITH ENERGY STORAGE (CCCES)

SUSTAINABLE ENERGY SOLUTIONS

\$499,999

Sustainable Energy Solutions (SES) was founded in 2008 in response to a growing need for solutions to sustainability problems within the energy industry. SES is primarily focused on the development and commercialization of Cryogenic Carbon Capture, a patented carbon capture technology developed in 2008.

Sustainable Energy Solution's CCCES process stores energy efficiently and changes load rapidly over a significant fraction of a power plant capacity. This technology can reduce peak load parasitic losses by shifting loads to non-peak or cheaper generation times. The rapid load change capability provides major grid management capabilities that are essential to accommodate intermittent supplies, such as wind and solar energy.

THE CCEMC PROJECTS

LEGEND

- Cleaner Energy Production from Fossil Fuels
- Carbon Capture and Storage Project
- Renewable Energy Project
- Energy Efficiency Project

ROUND ONE – JUNE 2010

ORGANIZATION	CCEMC FUNDING	PROJECT	LOCATION	TOTAL PROJECT VALUE
E-T Energy Ltd.	\$6,862,000	Poplar Creek Project, ET-DSPTM for Development of Athabasca Oil Sands	Poplar Creek	\$19.984 million
ESEIEH Consortium	\$16,474,810	Enhanced Solvent Extraction Incorporating Electromagnetic Heating.	Alberta	\$32.95 million
HTC Pureenergy Inc.	\$315,000	HTC Pureenergy CO2 Capture FEED Study for Devon's Jackfish SAGD Facility	Conklin	\$630,000
GE Company	\$1,677,919	Ceramic membrane-based technology for H2 production with CO2 capture and sequestration	Edmonton	\$3.36 million
Suncor Energy Inc.	\$2,500,000	OTSG Oxy-fuel Demonstration	Christina Lake	\$5 million
Enerkem Inc.	\$1,800,000	Reduction of GHG Emissions through Greening Biofuel Production and CO2 Utilization: From Pilot Plant to Commercialization	Edmonton	\$5.46 million
City of Medicine Hat	\$3,000,000	Medicine Hat Concentrating Solar Thermal Power Project	Medicine Hat	\$9 million
Lethbridge Biogas General Partnership	\$8,200,000	Lethbridge Biogas, Biogas Cogeneration Project	Lethbridge	\$40.5 million
Enmax Corp.	\$14,518,000	Home generation	Alberta	\$65.42 million
Evergreen Energy Technologies Inc.	\$150,000	Reliable Power for Remote Locations	Calgary	\$300,000
May-Ruben Technologies Inc.	\$569,704	BFE Thermally Driven Refrigeration System	Alberta	\$1.42 million
Nova Chemicals Corp.	\$700,000	Energy Footprint Reduction for Ethylene Manufacturing	Joffre	\$1.47 million
Suncor Energy Inc.	\$790,905	Alberta Oil Sands Energy Efficiency and GHG Mitigation Roadmap	Fort McMurray	\$1.94 million
Genalta Power Systems Inc.	\$1,849,000	Waste Energy to Power Utilization within an Amine Facility	Ram River	\$3.77 million

LEGEND

- Cleaner Energy Production from Fossil Fuels
- Carbon Capture and Storage Project
- Renewable Energy Project
- Energy Efficiency Project

ROUND TWO – FEBRUARY 2011

ORGANIZATION	CCEMC FUNDING	PROJECT	LOCATION	TOTAL PROJECT VALUE
Weyerhaeuser Company Ltd.	\$5,000,000	Weyerhaeuser Grande Prairie Evaporator Project	Grande Prairie	\$72.6 million
Encana Corp.	\$2,400,000	Vent Gas Capture for Engine Fuel Use	Alberta	\$5.45 million
ConocoPhillips Canada	\$7,000,000	Company-Wide Rollout of a Systematic Energy Efficiency Program Leading to Significant GHG Reductions in Alberta's Oil and Gas Industry	Alberta	\$14.05 million
Cenovus Energy Inc.	\$3,266,077	REMVue/Slipstream Air/Fuel Ratio Control and Vent Capture Project.	Alberta	\$9.41 million
NRGreen Power Ltd.	\$7,000,000	Whitecourt Recovered Energy Project	Whitecourt	\$63.21 million
Quantiam Technologies Inc.	\$2,100,000	Catalyzed-assisted manufacture of olefins (CAMOL) Generation-(2) for Energy and GHG Reductions in High-severity Ethane Crackers.	Alberta	\$4.2 million

ROUND THREE – JUNE 2011

ORGANIZATION	CCEMC FUNDING	PROJECT	LOCATION	TOTAL PROJECT VALUE
Coastal Hydropower Corp.	\$2,648,650	Carseland Very Low Head (VLH) Small Hydro Project	Carseland	\$5.74 million
West Fraser Timber	\$5,000,000	Slave Lake Pulp Bio-Methanation Project	Slave Lake	\$32 million
Growing Power Hairy Hill L.P.	\$5,000,000	GPBH Integrated BioRefinery™	Hairy Hill	\$45.7 million
BioRefinex Canada Inc.	\$10,000,000	Lacombe Biorefinery	Lacombe	\$37.537 million

Complete project descriptions can be found at ccemc.ca

THE CCEMC PROJECTS

LEGEND

- Cleaner Energy Production from Fossil Fuels ● Carbon Capture and Storage Project
- Renewable Energy Project ● Energy Efficiency Project

ROUND FOUR – JULY 2012

ORGANIZATION	CCEMC FUNDING	PROJECT	LOCATION	TOTAL PROJECT VALUE
Cenovus Energy Inc.	\$10,000,000	Looping Steam Generator – 10 MW Pilot	Christina Lake	\$62 million
Husky Energy	\$2,955,000	Lashburn CO ₂ Capture Demonstration Project	Lloydminster	\$10 million
Inventys Thermal Technologies Inc.	\$3,068,000	VeloxoTherm™ CO ₂ Capture Project	Joffre	\$6.136 million
Imperial Oil	\$10,000,000	Cyclic Solvent Process pilot	Cold Lake	\$96.996 million
MEG Energy Corp.	\$10,000,000	Heavy Crude Quality Improvement	Alberta Industrial Heartland Region	\$103.6 million
N-Solv Corporation	\$10,000,000	N-Solv BEST Pilot Plant at Suncor Dover	Fort McMurray	\$49 million

LEGEND

- Cleaner Energy Production from Fossil Fuels
- Carbon Capture and Storage Project
- Renewable Energy Project
- Energy Efficiency Project

ROUND FIVE – OCTOBER 2012

ORGANIZATION	CCEMC FUNDING	PROJECT	LOCATION	TOTAL PROJECT VALUE
Carbon Engineering Ltd.	\$499,901	Direct Air Capture – Pilot Plant Demonstration	Calgary	\$1.264 million
CO2 Solutions Inc.	\$500,000	Optimization of Enzymatic System for CO2 Capture from Oil Sands Production	Province-wide	\$1.789 million
Sustainable Energy Solutions	\$499,999	Cryogenic Carbon Capture with Energy Storage (CCCES)	Orem, Utah	\$1 million
E3P Technologies, Inc.	\$500,000	High Efficiency Engine Project	Alberta	\$5.784 million
Global Analyzer Systems Ltd.	\$300,000	Stack-Top Temperature Reduction Project	Calgary	\$998,342
Imtex Membranes Corp.	\$500,000	Energy Efficient Membrane Refining of Olefins for the Petrochemical Industry	Province-wide	\$6.137 million
Pahl's Preventative Maintenance	\$443,223	Pump Jack Optimization and GHG Reduction using Best Available Technology	Alberta (various sites)	\$886,446
Landmark Group of Builders	\$499,200	NetZero (Ready) Home Design and Demonstration for Production Housing	Calgary, Edmonton, Red Deer	\$2.501 million
Seal Well Inc.	\$500,000	Permanent Sealing of GHG Emitting or Sequestration Wells with a Bismuth-Based Metal Alloy	Province-wide	\$1.063 million
Hitec Fuel Systems Ltd.	\$274,218	Engineering of the Natural Gas Dual Fuel Blend System for Heavy Duty Diesel Vehicles	Province-wide	\$550,050
Lancaster Wind Systems Inc.	\$500,000	LWS Energy Storage Solution Pilot Project	Nisku	\$1.250 million
Salt Canada Inc.	\$500,000	Regional Municipality of Wood Buffalo Aerobic Landfill Project	Fort McMurray	\$9.035 million
Saltworks Technologies Inc.	\$500,000	Low Energy Produced Water Treatment	Vancouver, BC	\$2.190 million

Complete project descriptions can be found at ccemc.ca

INDEPENDENT AUDITOR'S REPORT



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Independent Auditor's Report

To the Board of Directors of
Climate Change and Emissions Management Corporation

We have audited the accompanying financial statements of the Climate Change and Emissions Management Corporation, which comprise the statement of financial position as at May 31, 2012, 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 generally accepted accounting principles, 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 in our audit 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 the Climate Change and Emissions Management Corporation as at May 31, 2012, and the results of its operations and its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

Deloitte & Touche LLP
Chartered Accountants

September 26, 2012

FINANCIAL HIGHLIGHTS

STATEMENT OF FINANCIAL POSITION

	2012	2011
	\$	\$
ASSETS		
CURRENT ASSETS		
Cash	234,769,119	13,868,011
Short-term investment	-	170,000,000
Accounts receivable	67,149	164,564
Interest receivable	278,900	634,589
Prepaid expenses	1,833	1,927
	235,117,001	184,669,091
LIABILITIES		
CURRENT LIABILITIES		
Accounts payable and accrued liabilities	3,640,311	1,082,556
COMMITMENTS AND GUARANTEES (NOTE 8)		
NET ASSETS		
GENERAL FUND – UNRESTRICTED		
	-	-
RESTRICTED FUND (NOTE 4)		
	231,476,690	183,586,535
	231,476,690	183,586,535
	235,117,001	184,669,091

APPROVED BY BOARD OF DIRECTORS



Eric Newell
Chair, Climate Change and Emissions Management
(CCEMC) Corporation



Aaron Falkenberg
Chair, Audit and Investment Committee,
Climate Change and Emissions Management
(CCEMC) Corporation

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

FINANCIAL HIGHLIGHTS

STATEMENT OF CHANGES IN NET ASSETS

	General Fund	Restricted Fund	2012	2011
	\$	\$	\$	\$
BALANCE - BEGINNING OF YEAR	-	183,586,535	183,586,535	123,306,839
Excess of revenue over expenses	(8,481)	47,898,636	47,890,155	60,279,696
Transfer to (from) fund (note 4)	8,481	(8,481)		
BALANCE - END OF YEAR	-	231,476,690	231,476,690	183,586,535

STATEMENT OF OPERATIONS

	General Fund	Restricted Fund	2012	2011
	\$	\$	\$	\$
REVENUE				
Grant revenue (note 5)	-	72,821,928	72,821,928	62,781,105
Interest income	-	2,974,262	2,974,262	1,711,549
Conference revenue and sponsorship	-	-	-	251,530
	-	75,796,190	75,796,190	64,744,184
PROJECT EXPENSES (NOTE 8)	-	23,008,878	23,008,878	142,601
EXCESS OF REVENUE OVER PROJECT EXPENSES	-	52,787,312	52,787,312	64,601,583
OPERATING EXPENSES				
Program management (note 6)	-	4,308,607	4,308,607	3,347,013
Consulting contracted services	-	160,373	160,373	296,671
Corporate costs	-	167,790	167,790	134,062
Board remuneration and expenses (note 6)	-	116,242	116,242	114,583
Outreach	-	80,900	80,900	48,800
Professional fees	-	43,670	43,670	34,963
Insurance	-	11,094	11,094	11,713
Conference costs	8,481	-	8,481	334,082
	8,481	4,888,676	4,897,157	4,321,887
EXCESS OF REVENUE OVER EXPENSES FOR THE YEAR	(8,481)	47,898,636	47,890,155	60,279,696

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

STATEMENT OF CASH FLOWS

	2012	2011
	\$	\$
CASH PROVIDED BY (USED IN)		
OPERATING ACTIVITIES		
Excess of revenue over expenses for the year	47,890,155	60,279,696
Net change in non-cash working capital items		
Decrease in prepaid expenses	94	-
Decrease (increase) in accounts receivable	97,415	(94,549)
Decrease (increase) in interest receivable	355,689	(634,589)
Increase in accounts payable and accrued liabilities	2,557,755	387,334
	<u>50,901,108</u>	<u>59,937,892</u>
INVESTING ACTIVITIES		
Proceeds on disposal of investments	170,000,000	-
Purchase of investments	-	(170,000,000)
	<u>220,901,108</u>	<u>(110,062,108)</u>
INCREASE (DECREASE) IN CASH	220,901,108	(110,062,108)
CASH – BEGINNING OF YEAR	13,868,011	123,930,119
CASH – END OF YEAR	<u>234,769,119</u>	<u>13,868,011</u>

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

FINANCIAL HIGHLIGHT NOTES

1 ORGANIZATION

The 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, whose operations commenced on June 1, 2009. CCEMC's mandate is to reduce greenhouse gas emissions and adapt to climate change by supporting the discovery, development and deployment of clean technologies. 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 greenhouse gas emissions and improve its ability to adapt to climate change. The Fund provides the primary source of revenue for the CCEMC. As a not-for-profit organization, CCEMC is exempt from tax in accordance with 149(1)(l) of the Canadian Income Tax Act.

2 SIGNIFICANT ACCOUNTING POLICIES

These financial statements have been prepared by management in accordance with Canadian generally accepted accounting principles ("GAAP") within the framework of the accounting policies summarized below.

a) Fund accounting - For financial reporting purposes, the accounts have been classified into the following funds:

i) **General**
The General Fund includes all resources available for immediate purposes and accounts for the Corporation'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 the Corporation's discretion.

ii) **Restricted**
The Restricted Fund includes those funds whose resources are to be used to support investment in innovation and clean technologies and adaptation to climate change.

b) Revenue recognition - These financial statements have been prepared using the restricted fund method of accounting for contributions; the key elements of which are:

i) Unrestricted contributions are recognized as revenue in the General Fund when received or upon becoming receivable if the amount to be received can be estimated and collection is reasonably assured.

ii) 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.

iii) Investment income earned on contributions subject to external restrictions is recorded as revenue in the Restricted Fund in the year it is earned.

c) Financial instruments - CCEMC's financial assets include cash, accounts receivable, interest receivable and short-term investments. Cash and investments are classified as held-for-trading and are recorded at fair value with realized and unrealized gains and losses reported in the statement of operations for the period in which they arise. Accounts receivable are classified as loans and receivables and are accounted for at amortized cost using the effective interest rate method. Accounts receivable are initially recorded at fair value. Due to the short-term nature of CCEMC's receivables, the carrying amount approximates fair value.

CCEMC's financial liabilities include accounts payable and accrued liabilities. These are classified as other liabilities and are accounted for at amortized cost using the effective interest rate method. Financial liabilities are initially measured at fair value. Due to the short-term nature of CCEMC's payables, the carrying amount approximates fair value.

The fair value of a financial instrument on initial recognition is normally the transaction price, which is the fair value of the consideration given or received. Subsequent to initial recognition the fair values of financial instruments that are quoted in active markets are based on bid prices for financial assets. Purchases and sales of financial assets are accounted for at trade dates. Transaction costs on financial instruments are expensed when incurred.

d) Cash - Cash consists of cash on deposit.
e) Short-term investment - The short-term investment is a redeemable flexible guaranteed investment contract with an annual interest rate of 1.25% that was redeemed on October 21, 2011 prior to the maturity date of February 10, 2012.

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

3 CHANGE IN ACCOUNTING FRAMEWORK

In December 2010, the Canadian Accounting Standards Board issued a comprehensive set of accounting standards applicable to not-for-profit organizations.

The standards applicable to not-for-profit organizations are effective for fiscal years beginning on or after January 1, 2012 and require retrospective application, except for certain exemptions and exceptions contained within the standards. Early adoption of the standards is permitted.

For years beginning on or after January 1, 2012, not-for-profit organizations have been given the choice to apply the Accounting Standards Board's Accounting Standards for Not-For-Profit Organizations ("ASNPO") contained in Part III of the CICA Handbook or International Financial Reporting Standards ("IFRS"). The ASNPO are largely based on those in the 4400 series of the CICA Handbook. A not-for-profit organization that applies Part III of the Handbook also applies the standards for private enterprises in Part II of the Handbook to the extent that the Part II standards address topics not addressed in Part III. CCEMC has chosen to adopt ASNPO for the next fiscal year.

CCEMC is in the process of assessing the impact of this change in accounting framework, and has not yet determined if any adjustments or additional disclosures, will be required for the first time adoption of ASNPO.

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 relating to one of the four strategic investment areas: conservation and efficiency, carbon capture and storage, greening energy production and adaptation and knowledge. The funds are also restricted for the purpose of administering CCEMC which includes fees, expenses, liabilities and other costs. During the year, \$8,481 (2011 - \$82,552) was transferred from the Restricted Fund to the General Fund for the purpose of supporting the GHG Reduction Summit held in May 2011. This expenditure was approved in the annual CCEMC business plan.

5 GRANT REVENUE

Funds are granted from the Government of Alberta to CCEMC on an annual basis through the Grant Agreement dated March 31, 2009 ("Grant Agreement"), which is effective through to September 1, 2014. The Grant Agreement was amended on March 30, 2010. The Annual Grant amount is determined each provincial year-end and is based on the amount contributed to the Fund in the previous compliance year.

ANNUAL GRANT AMOUNT	2012 \$	2011 \$
March 31, 2010	-	62,781,105
March 31, 2011	72,821,928	-
	72,821,928	62,781,105

6 BOARD AND MANAGEMENT REMUNERATION

Total honorariums and expenses related to the directors of the Board were \$116,242 (2011 - \$114,583) in the fiscal year. Remuneration paid to directors includes honorariums totalling \$71,263 (2011 - \$69,941) as follows:

	2012 \$	2011 \$
D. Beever	3,198	4,346
J. Carter	1,725	1,763
P. Clark	16,566	4,782
A. Falkenberg	4,816	7,958
C. Fischer	2,214	2,961
R. P. Galachuk	1,971	3,526
G. Holden	-	656
B. Kenny	2,706	4,182
D. Lewin	8,311	9,901
D. Lynch	4,680	4,674
R. L. Mansell	4,431	3,362
P. Merrin	4,414	4,830
E. Newell	10,441	9,087
R. Neehall	2,094	2,829
A. Tasker	3,696	5,084
	71,263	69,941

Of these amounts, \$7,147 (2011 - \$5,107) is included in accounts payable and accrued liabilities. Expenses paid to directors of \$44,979 (2011 - \$44,642) relates to reimbursements for meals, travel and accommodations.

Program management expenses include remuneration to contract management who report directly to the Board, totalling fees of \$4,308,607 (2011 - \$3,347,013). Of this amount, \$537,926 (2011 - \$519,295) is included in accounts payable and accrued liabilities.

7 CAPITAL DISCLOSURES

CCEMC defines capital as its general and restricted funds. The majority of CCEMC's funds are granted by the Government of Alberta and paid through the Fund in periodic instalments during the year. CCEMC's objectives for managing capital are to ensure that there are sufficient funds to support its expenses and approved project funding. To meet this objective, CCEMC develops and monitors annual and long term budgets. Commitments are based on existing Contribution Agreements, budgets and accumulated reserves. Refer to note 8 for information on commitments.

8 COMMITMENTS AND GUARANTEES

During the year, contribution agreements for CCEMC funding were executed for 9 projects (2011 - 16). Also during the year, two of the executed contribution agreements were cancelled. As at May 31, 2012, the CCEMC has 23 executed contribution agreements outstanding and has commenced or completed funding for 17 of these approved projects. 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:

	2012 \$	2011 \$
Total committed funds for executed projects - Beginning of the year	71,256,876	-
Total funds for executed projects approved during the year	39,428,233	71,399,477
Project expenses incurred during the year	(23,008,878)	(142,601)
Contribution agreements cancelled during the year	(11,570,000)	-
Total committed funds for executed projects - End of the year	76,106,231	71,256,876

As of May 31, 2012, funding for 6 of the 23 executed projects have not commenced. Funds allocated to the executed contribution agreements are subject to CCEMC'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 \$76,106,231, but will not exceed this amount.

There are also an additional 24 projects, totalling \$73,047,441 (2011 - \$54,873,650), that have been approved for funding by CCEMC's Board of Directors but for which contributions agreements have not yet been executed.

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

9 FINANCIAL INSTRUMENTS

CCEMC'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 CCEMC if a party to a financial instrument fails to meet its contractual obligation and arises principally from the cash, short-term investments 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 that CCEMC is exposed to significant credit risk at the Statement of Financial Position date.

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

Liquidity risk - Liquidity risk is the risk that CCEMC will not be able to meet its financial obligations as they become 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.

10 ECONOMIC DEPENDENCE

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

11 PRIOR YEAR COMPARATIVES

Certain amounts have been reclassified in the comparative figures to conform to current year presentation.



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