



## ENERGY EFFICIENCY PROJECTS

The Climate Change and Emissions Management (CCEMC) Corporation announced June 23 that it is funding six energy efficiency projects, totalling more than \$5.7 million. The following summary of energy efficiency projects funded by the CCEMC includes descriptive information provided by project proponents.

Organization: Evergreen Energy Technologies Inc.  
CCEMC Funding: \$250,000  
Project: Reliable Power for Remote Locations

Evergreen is a startup technology company located in Calgary. Darryl West is the president, owner, and only full-time employee. The focus of the company is the development and commercialization of new technology that will lessen the environmental impact of the energy industry.

Pneumatic gas venting devices at wells waste natural gas and create greenhouse gas emissions. Evergreen's Power Pod technology replaces pneumatics with hybrid Direct Methanol Fuel Cell (DMFC)/solar power generation, allowing 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. A prototype was built and operated successfully. This CCEMC project covers field-testing and market demand evaluation, and will bring the technology to commercialization.

Organization: May-Ruben Technologies Inc.  
CCEMC Funding: \$569,704  
Project: BFE Thermally Driven Refrigeration System

May-Ruben Technologies is a subsidiary of Alberta Mining Corporation (AMC) a third-generation, Calgary-based company. May-Ruben Technologies was founded by AMC and Wayne May, chief scientist, to provide access to clean energy and clean water to people around the world through technological innovation.

BFE (Binary Fluid Injector) technology will yield a high-performance heat pump or refrigeration cycle driven directly by thermal energy instead of electricity, something which does not exist today. Such a device would unlock the wide spread use of renewable thermal energy (such as waste heat, geothermal, or solar thermal) to do useful work supplying industrial process heat, space heating and cooling, or even remediation of polluted water through distillation. Where renewable energy is not available, fuel switching from electricity to natural gas will still save up to 75 per cent on energy costs for applications such as air conditioning and reduce greenhouse gas production by an even greater percentage.

Organization: Nova Chemicals Corporation  
CCEMC Funding: \$700,000  
Project: Energy Footprint Reduction for Ethylene Manufacturing

NOVA Chemicals develops and manufactures chemicals, plastic resins and end-products that make everyday life safer, healthier and easier. Their 2,500 employees work to ensure health, safety, security and environmental stewardship through a commitment to sustainability and Responsible Care®. NOVA Chemicals, headquartered in Calgary, Alberta, is a wholly owned subsidiary of The International Petroleum Investment Company (IPIC) of the Emirate of Abu Dhabi.

This project aims to improve separation processes in ethylene manufacturing by developing innovative micro porous molecular sieves and processes designed to separate similar hydrocarbon molecules. Current ethylene manufacturing gas separations consume energy to condense and boil hydrocarbon mixtures. The energy consumption for molecular sieve separation is inherently lower, so its application in ethylene manufacturing can significantly reduce energy consumption and carbon dioxide emissions.

Organization: Suncor Energy Inc.  
CCEMC Funding: \$790,905  
Project: Alberta Oil Sands Energy Efficiency and GHG Mitigation Roadmap

Suncor Energy Inc. is Canada's premier integrated energy company. Suncor's operations include oil sands development and upgrading, conventional and offshore oil and gas production, petroleum refining, and product marketing under the Petro-Canada brand. While working to responsibly and sustainably develop petroleum resources through innovative technologies and processes, Suncor is also developing a growing renewable energy portfolio.

The Alberta Oil Sands Energy Efficiency and GHG Mitigation Roadmap will quantify potential greenhouse gas emission reductions from technology and operational improvements in energy use at Suncor's bitumen mining, Steam Assisted Gravity Drainage (SAGD) and upgrading facilities. The magnitude and cost effectiveness of greenhouse gas mitigation alternatives will be compared, and a roadmap developed that can assess the greenhouse gas footprint of other similar facilities and identify future technology needs. Suncor will be assisted by Jacobs Consulting to complete this project

Organization: Great Northern Power Corp.  
CCEMC Funding: \$1.57 million  
Project: Conversion of waste heat from reciprocating engines into electricity, using Great Northern Power's Expander System

Great Northern Power (GNP) is an independent, Calgary-based, power generation company focused on converting waste heat into electricity. GNP developed and built the first "EXPANDER" system, a skidded unit that converts waste heat from reciprocating engines into clean electricity. These reciprocating engines are typically used in natural gas compression and remote power generation applications.

The CCEMC is participating in the building and demonstration of 10 EXPANDER units. These systems will be installed on natural gas compressor stations operating in Alberta. The EXPANDER system generates electricity which displaces electricity which would have been produced from fossil fuels. In addition, the EXPANDER system reduces the fuel consumption of each engine by increasing the efficiency of its shaft horsepower production. As a general rule of thumb, every 1,000 horsepower of installed operating engine should offset 1,000 tonnes

Organization: Genalta Power Systems Inc.

CCEMC Funding: \$1.849 million

Project: Waste Energy to Power Utilization within an Amine Facility

Genalta Power Systems Inc. is a Canadian owned renewable energy company with operations in Alberta and B.C. Their primary focus is on creating cost-effective and environmentally responsible electricity through developing projects and technologies that convert wasted energy to power within the Oil and Gas industry. Their goal is to work with the site owner to provide:

- Base load green energy
- Increased plant efficiencies
- Operating cost reductions
- Greenhouse credits and emission reductions
- Long term sustainable energy

The project will produce clean electricity from the recovery of a variety of waste energy sources identified within a sour gas facility. The project will provide 1 to 3 MW of power production while validating the economic and technological viability of distributed power generation within the plant.

Once implemented the results will illustrate the reliability and cost effectiveness of waste heat to power and provide a replicable and exportable technology to maximize the efficiencies of a sour gas facility.