UNIVERSITY OF CALGARY | SAIT

Global Research Initiative in Sustainable Low Carbon Unconventional Resources

Transforming energy research to fuel a clean energy future.

The Global Research Initiative in Sustainable Low Carbon Unconventional Resources (GRI) is a major vehicle to translate lab-based technology innovations into field-deployable solutions. Focused on collaborative research between the world-class innovators from the University of Calgary and international partners, GRI creates a network of global hubs for discovery, creativity and innovation in unconventional energy research.

Originating from the $75 million Canada First Research Excellence Fund (CFREF) awarded to the University of Calgary in 2016, GRI has made huge progress in generating clean-tech solutions by seeking new, innovative unconventional energy systems that are low or zero carbon.

Theme 3: CO_2 Conversion

CO_2 Conversion is one of three pillars of energy research in GRI. The primary goal of this research is to avoid negative environmental impacts by converting or sequestering CO_2 using renewable energy.

17 research projects

32 GRI faculty members involved

9 start-up companies

36 new jobs created

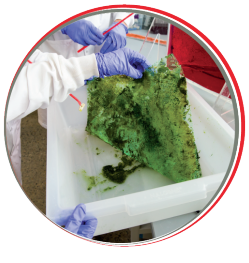
66 student opportunities created

32 postdoctoral fellows recruited

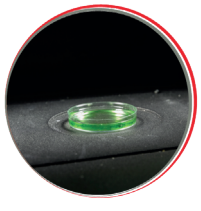
33 awards received by GRI researchers

103 CFREF supported proceedings & publications

Projects



- Zero CO_2 emission energy extraction from petroleum reservoirs
- Effective catalysts for conversion of CO_2 into synthetic fuel
- Bioenergy: CO_2 conversion by photosynthesis
- Adding value to waste biomass
- Realizing negative emissions with enhanced oil recovery by CO_2 sequestration



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CO_2 Conversion

The theme 3 research, led by Dr. Marc Strous is engaged in developing processes for CO_2 conversion and sequestration, as well as for producing hydrogen or electricity from petroleum reservoirs. For example, one research team converts CO_2 to fuel and commodity chemicals by combining recent advances in low-temperature and mixed metal oxide catalysts with new, porous electrode materials for electrolytic cells. Another team converts CO_2 to valuable products, methane and electricity by combining designer microbiomes with printed electronics (organic solar cells).

For CO_2 sequestration, they make use of the uniquely instrumented Alberta field site at the Containment and Monitoring Institute (CaMI). For carbon capture, Theme 3 researchers are developing new metal-organic frameworks and process configurations. Other theme 3 researchers envisage petroleum reservoirs as geological microbial fuel cells or flow batteries, with electrodes placed inside the reservoir or electron shuttles recycled between the reservoir and an above ground fuel cell.

Theme 3 is led by Prof. Marc Strous with support from Research Associate Angela Kouris. Other University of Calgary faculty members leading projects under Theme 3 are Prof. Stephen Larter, Prof. Warren Piers, Prof. Jinguang Hu, and Prof. Sean McCoy.

Driving Innovation. Fueling Results.

Partner with UCalgary and help us transform energy research to fuel a clean energy future. Get started: ucalgary.ca/gri

CANADA FIRST RESEARCH EXCELLENCE FUND

This research has been conducted, in part, thanks to the Canada First Research Excellence Fund.