

logen's leadership in cellulosic ethanol production attracts multi-million-dollar funding

Royal Dutch Shell, Goldman Sachs, Petro Canada and the Government of Canada get behind logen's initiatives to commercialize bio-fuel production from renewable, non-food feedstocks such as cereal straws

Fast facts

Corporate profile

Made from the non-food portion of renewable feedstocks such as cereal straws, cellulosic ethanol is one of the most cost effective ways to reduce greenhouse gas emissions and gasoline use in road transport. Ottawa's logen Corp. is a world leader in cellulosic ethanol technology.

Why Ottawa

Ottawa affords logen executives access to national and international intelligence on issues and funding surrounding climate change and sustainable fuels. In March of 2008, Ottawa-based Sustainable Development Technology Canada (SDTC) announced that logen's application for funding for Canada's first commercial scale cellulosic ethanol production facility has progressed to the due diligence phase.

Business advantage

Because of its ability to produce both fuel and energy, the US Department of Energy life-cycle analysis states that ethanol from cellulose reduces greenhouse gases by up to 80% compared to gasoline.

Cellulosic ethanol is an advanced, renewable biofuel that can be used in today's cars. Made from the non-food portion of renewable feedstocks such as cereal straws, it is one of the most cost effective ways to reduce greenhouse gas emissions and gasoline use in road transport. Ottawa's logen Corp. is a world leader in cellulosic ethanol technology and has attracted more than \$130 million of



private and public sector investment over the past 25 years from partners including Royal Dutch Shell, Goldman Sachs, Petro Canada and the Government of Canada.

logen's cellulosic ethanol process uses advanced new technology to make ethanol from biomass. The process combines innovations in pre-treatment, state-of-the-art enzyme technology, and advanced fermentation technology. Pre-treated fibre is converted to sugars using enzymes; sugars are subsequently fermented to ethanol; and ethanol is purified to fuel.

Established in the 1970s, logen's 278 employees also develop, manufacture and market enzymes used to modify and improve the processing of natural fibres within the textile, animal feed, and pulp and paper industries.

In cellulosic ethanol, logen has built and operates the world's first demonstration scale plant to convert biomass to cellulosic ethanol using enzyme technology. The plant is designed to prove the feasibility of logen's cellulosic ethanol process by validating equipment performance and identifying and overcoming production problems prior to the construction of larger plants.

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Renewable fuels such as cellulosic ethanol represent a reliable domestic source of energy. Iogen intends to commercialize its cellulosic ethanol process by licensing its technology broadly through turnkey plant construction partnerships.

The plant can handle all functions involved in the production of cellulosic ethanol, including: receipt and pretreatment of up to 40 tonnes per day of feedstock; conversion of cellulose fibre into glucose; fermentation; and distillation. Wheat, oat and barley straw are used as raw materials, and the plant capacity is approximately 2.5 million litres of cellulosic ethanol per year.

Why Ottawa

Ottawa offers Iogen employees an unparalleled quality of life compared to other North American cities. As a national capital, Ottawa affords Iogen executives access to national and international intelligence on issues and funding surrounding climate change and sustainable fuels. In March of 2008, Ottawa-based Sustainable Development Technology Canada (SDTC) announced that Iogen's

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application for funding for Canada's first commercial scale cellulosic ethanol production facility has progressed to the due diligence phase.

Business advantage

Cellulosic ethanol and conventional (grain based) ethanol are both ethanol products that can be easily integrated into the existing fuel distribution system. The primary difference between the two types of ethanol products is that conventional fuel ethanol is derived from grains such as corn and wheat.

Cellulosic ethanol is made from the non-food portion of renewable feedstocks such as cereal straws and corn stover. With the Iogen process, the lignin in the cellulose ethanol can be used to generate electricity, which in turn can be utilized to run the plant.

Because of its ability to produce both fuel and energy, the US Department of Energy life-cycle analysis states that ethanol from cellulose reduces greenhouse gases by up to 80% compared to gasoline.

The Canadian government estimates that, "If 35% of gasoline in Canada contained ten percent ethanol, GHG emissions would be reduced by 1.8 megatonnes per year (1.8 million tonnes), which is the equivalent of removing more than 400,000 vehicles from the road."

Renewable fuels such as cellulosic ethanol represent a reliable domestic source of energy and generate economic and environmental benefits. Blending ethanol with gasoline extends the fuel supply, reduces the amount of oil needed by hundreds of thousands of barrels each day, and lowers overall fuel cost.

Future growth plans

With the progress with SDTC to date, Iogen is a step closer to developing a commercial cellulosic ethanol production facility in Canada. Long-term, Iogen intends to commercialize its technology broadly through turnkey plant construction partnerships.

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