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Canadian Clean Technology Showcase

January 2014

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Canadian Clean Technology Showcase

It is my pleasure to introduce the 21 companies in our Clean Technology Showcase. The objective of this Showcase is to bring you closer to an exclusive selection of clean technology leaders building their companies in Canada. These 21 companies hail from across the country and represent a broad spectrum of technologies, at varying stages of maturity. The following criteria were considered in choosing the Showcase constituents:

1. Is the technology a novel solution to a recognized environmental problem?
2. Has the technology moved beyond concept, and at a minimum, qualified for R&D support?
3. Does the company have an experienced and dedicated management team to drive the technology forward?

Each profile in this brochure includes a synopsis of the company's value proposition, an explanation of what they're working on now, and their plans for the next 2 to 3 years.

You'll notice that every profile also includes the picture of an executive leader participating in the Partnerships for Canada's Clean Economy 2014 conference. The leaders are in attendance to meet with interested parties so please take the opportunity to familiarize yourself with the companies and their executives. If you don't find yourself sitting at the table of someone you'd like to talk to, then introduce yourself during one of the breaks. We hope you take advantage of this excellent opportunity to build partnerships with the companies who are working hard to shape Canada's clean economy.

Many thanks to all the cleantech leaders for their participation in our Canadian Clean Technology Showcase.

Neil Thomson
Director, Clean Capital

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BionicPower

Yad Garcha, CEO

Bionic Power enables recharging of batteries by harvesting power from walking without additional metabolic effort. The Company has been developing the product with support and funding from the Canadian military and the U.S. Army.

Bionic Power is currently in the final phases of assembling units that will be used for validation tests by the U.S. Army and/or their labs. These tests will take place in approximately two months. After these tests, the U.S. Army is expected to extend the support and funding to further develop the technology until deployment.

A defence customer believes that in the future, the dismounted soldier capabilities will continually be modernized with advanced sensors, networking and processing technologies, all of which require power. While many of these new capabilities will possess advanced low power electronics and power management features, the need for innovative power source solutions for the dismounted soldiers and small combat units will remain an essential aspect of the army's current and future soldier programs. Emerging operational concepts dictate the need for technology to support extended missions without the benefit of resupply for 72 hours or longer.

Bionic Power has been told that personal energy harvesters have enormous potential, particularly over long duration missions, by being able to provide continuous, onthemove recharge and onsoldier backup electrical power generation. The advantage that energy harvesting systems have is a higher weight and lower power density than the conventional power sources while still being competitive with stored energy systems during longer missions.

Once the Defence product is near completion, Bionic Power will take the core technology and develop a product for other professionals that use mobile technology. Other professionals include: forest fire fighters, first responders after major emergencies, geologists, surveyors, border patrol, and other researchers collecting data using electronic devices.

Bionic Power is a privately held company that was spun out from Simon Fraser University in 2008.

Wade Sheen, President and CEO

Cooledge Lighting, Inc, is a Burnaby, BC based Venture Capital backed company committed to redefining the way lighting is implemented in the spaces where we live, work and play. Cooledge's award winning and patented technology consists of a large array of small LEDs that is physically flexible, easy to incorporate into a wide range of materials and designs, and produces a highly efficient, visually comfortable light.

The Cooledge team is a collection of highly skilled, experienced and passionate LED lighting professionals, dedicated to producing an exceptional value proposition to the lighting designer, architect, building construction contractor and building owner/operator. Achieving efficiencies in luminaires of over 120 lumens / Watt, lighting constructed with Cooledge Light Sheet is 2x to 5x more efficient than traditional lighting and 1.5x more efficient than current competitive LED sources.

Cooledge Lighting, Inc. was founded in 2009 with technology from the University of Illinois, Urbana-Champagne, seed funding from ARCH Venture Partners (Austin, TX), and a core team of LED lighting professionals in Vancouver, BC, Canada. The team consists of 50 people split between Burnaby, BC, Austin, TX, and Munich, Germany. Cooledge employs an outsourced manufacturing model, with LEDs sourced from Asia, manufacturing assembly in the USA and final test and shipping from Canada. Cooledge has over 15 patents issued and allowed in both the USA and foreign countries and over 40 patents applied for.

Cooledge is backed by ARCH Venture Partners, BDC Ventures, Yaletown Venture Partners, GE Ventures and has received significant support from SDTC, Canada for R&D and pre-commercialization of the product.

DIACARBON™ energy inc.

Jerry Ericsson, President and Co-Founder

Strong demand for solid biofuels has been established both globally and locally, but to achieve chemical equivalence and logistical efficiencies to their fossil fuel counterparts, biomass must be “upgraded”. Thermochemical processes such as pyrolysis and torrefaction have demonstrated high potential for biomass upgrading, but the industry has progressed slowly and there are only a small number of pilot or commercial scale plants in operation.

Diacarbon is building a first of its kind in Canada, commercial demonstration torrefaction facility (TBR) with an output capacity of up to 40,000 tonnes per year. Diacarbon’s TBR helps bridge the gap between the increasing demand for alternate fuels and the abundant supply of low-value biomass by utilizing its torrefaction process to upgrade biomass into carbon-neutral biocoal (torrefied wood)-- a clean, direct replacement for coal.

Diacarbon’s business plan is to expand the market availability of biocoal, and to replicate the TBR technology through Build Own Operate projects with strategic partners (development partners, site owners and off-take partners) including entities that have access to feedstock.

Ron Klopfer, CEO

Etalim Inc., a startup company in Vancouver, Canada, is developing a totally new and patent-pending type of device that can generate electricity from any fuel or heat source with extraordinary efficiency, simplicity and reliability. Imagine a small “engine”, the size of a soccer ball, that operates at 40% efficiency, can be manufactured for $0.30 per Watt and can run maintenance-free for decades.

This technology, now past the full-scale prototype stage, will be highly disruptive to several markets for distributed or renewable power generation, such as residential cogeneration from natural gas (micro-CHP) and waste heat recovery from vehicle exhaust.

The scientists and engineers behind Etalim come from one of BC’s most successful tech stalwarts, Creo Inc. Etalim’s technology stems from some recent advances in thermoacoustic physics at Los Alamos.

Etalim was a winner of the New Ventures BC competition in 2009, and was awarded “Most Promising Pre-commercial Technology” in 2011 by the BC Technology Industry Association (BCTIA).

John McDonald, SVP Business Development

Society is increasingly embracing alternate energy sources and reducing energy wastage. In making this transition we are ushering in an era where variability is becoming the norm, both in energy source and consumption.

One of the challenges is that the efficiency of electric motors & generators drops precipitously when they are forced to operate across a wide range of speed and torque. To address this problem, EXRO developed a breakthrough technology for self-optimizing electric motors and generators, significantly improving their efficiency.

EXRO's Dynamic Current Management (DCM) senses changes in input energy and load, and optimizes the motor or generator by intelligently reconfiguring the inductors. It's like having multiple power curves in a single machine, and the benefit is that DCM dramatically improves overall system efficiency by reducing "off-peak" losses in electric generators and motors as well in the downstream power conditioning system.

Independent testing of Exro's DCM shows a remarkable improvement in the efficiency of both the rotating machine (electric motor / generator) and on the associated power electronics. Whether that efficiency translates into improved fuel efficiency for a GenSet, greater range for electric vehicles & hybrids, or higher output for wind and wave power, the net effect is an improvement to the economics of the entire system. Of course, the precise percentage improvement is dependent on the application and the system topology, but as a general rule, the higher the variability, the higher the efficiency improvement.

The company has placed significant effort into ensuring ease of adoption, and licenses its unique technology directly to OEM's across a wide range of applications and geographies.

FUEL TRANSFER TECHNOLOGIES INC.

James Wedderburn, CEO

Fuel Transfer Technologies Inc. (FTT, www.fttproducts.com) is a Canadian corporation located in Moncton, NB, focused on the research, development and manufacture of industry-leading technologies for a clean, easy and safer transfer of fuels, striving to be environmentally responsible and reduce pollution and gas emissions generated by existing fuel transfer products.

Today, there are over 88 million Portable Fuel Containers (PFC's) in use, and ~ 22 million PFC's sold annually in North America. The combined vapour emissions and spillage from PFC use in North America (~ 23 Million gallons spilled annually) is equivalent to the pollution created from more than 9 Million cars on the road every day.

In response to this serious environmental issue, FTT developed, and in late 2012, launched the G CAN® 20L Portable Refueling System (www.gcan.com). The G CAN® is a revolutionary portable refueling system engineered to prevent spills, recover harmful gasoline vapours while refueling and eliminate heavy lifting. It's the first and only system with built-in patented SmartSensingTM Technology providing automatic shutoff capability and offering complete refueling control. The G CAN® is CSA Certified and being sold across Canada; FTT is currently pursuing Certification of the G CAN® for US markets and abroad.

Fuel Transfer Technologies Inc. has an extensive patent portfolio consisting of 41 patents issued and 43 patent applications pending in a number of countries (including Canada, the United States, Europe, Australia, New Zealand and China). These issued and pending patents for numerous technologies cover a broad range of innovative fuel, chemical and liquid transfer products with consumer, commercial, and industrial applications. Following a successful soft-launch in 2013, FTT is seeking investment to support business expansion and 2014 retail demand (www.fttproducts.com/investing/).

Geoff Wensel, President and CEO

GR Green makes beautiful roofs and siding out of waste limestone and recycled plastic at a fraction of the cost of natural slate and cedar roofs. Our products are exceedingly green and look so real – we call them Naturally Synthetic!

Each GR Green roof saves over 4,400 plastic milk bottles and 44,000 plastic bags from going to the landfills.

We have developed and patented a new process to manufacture composite building products for the $12 Billion North American roofing and siding markets. GR Green's innovative process results in lower manufacturing costs which provide a sustainable competitive cost advantage over all our competitors. Using this new process we can also make composite siding, something our competitors can not do economically.

GR Green's manufacturing process is also revolutionarily sustainable and eco-friendly, with zero waste during and after production. GR Green's products will be certified under the most stringent Cradle to Cradle (C2C) manufacturing standard, GR Green's process up-cycles waste raw materials, causing no harm to the environment and wasting nothing in the process - our plant is zero waste, at the job site all the excess trim is returned to the plant to be re-processed into new finished products and all our old roofs and siding can be recycled into new products after 50+ years of use - nothing goes to the dump. GR Green was recently named a finalist in the Cradle to Cradle Institute's "Innovation Challenge", a world-wide competition seeking the best new "green" building materials.

We are operating a pilot plant in Burnaby at breakeven production, and market demand has exceeded our current production capacity. We are seeking the final $1.65 MM in equity investment of a total $3.3MM required to build a full-scale production facility in BC, in order to meet the proven market demand for our products.

Colin Armstrong, President

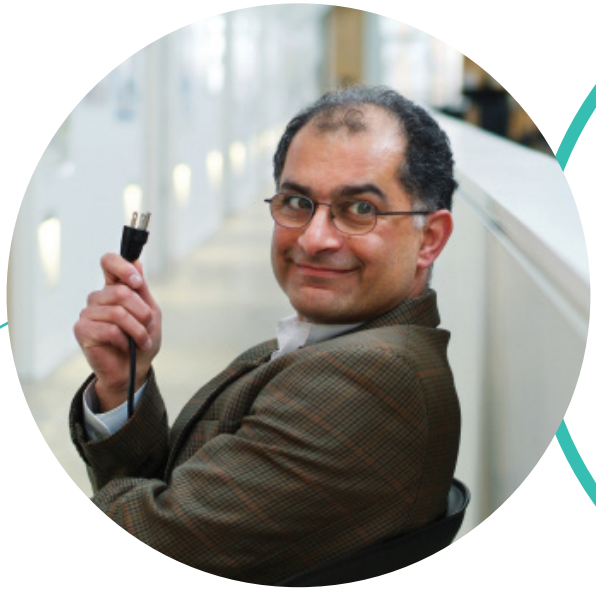
Hydrogen technology and energy are emerging as leading solutions for solving the following major global challenges:

REDUCING the use of the finite fossil fuel reserves,
IMPROVING urban air quality to improve quality of life,
LOWERING greenhouse gases emissions to limit climate change, and,
MANAGING the strains on aging electricity grids caused by high usage and renewables.

In the US, California is leading the charge and recently committed to low carbon fuel regulations, 1.5 million Zero Emission Vehicles, and over $100 million in funding to promote hydrogen fuelling stations. To align with these plans, Hyundai, Toyota and Honda recently confirmed that in 2014 & 2015, zero emission fuel cell electric vehicles with a range of over 300 miles and 3 minute fills will be available to the public at cost effective prices. In addition to the activities in transportation, both Germany and California have large initiatives using hydrogen energy to manage the instability of electrical grids caused by increased renewables.

HTEC's mission is to help clients improve operational performance, lower costs and reduce emissions, through the provision of leading edge process solutions, low carbon intensity hydrogen and advance fuelling infrastructure solutions. It is currently focused on expanding the following exciting key projects and areas of business to meet current market demands and position for itself for success:

- Engineered Systems – Apply HTEC many years of experience in hydrogen purification, processing, compression, liquefaction and distribution.
- Hydrogen Processing Facilities – The $16 million expansion of our North Vancouver operations will provide us with the capacity to purify, compress and liquefy over 500,000 kg per year of by-product hydrogen by Q4:2015.
- Hydrogen Fuel Distribution and Dispensing Infrastructure – HTEC currently owns and operates hydrogen distribution equipment and fuelling stations in Vancouver and plans to expand its network both locally and in California in 2014.



Hadi Dowlatabadi, Partner

Between 2004 and 2012, the global market for renewable energy investments grew from $40B to $244B. In this same period, the share of small, distributed systems rose from 20% to over 30%. Solar and Wind accounted for over 95% of all these investments.

HydroRun Technologies Ltd is the developer of HydroKite™ a technology that captures the energy of flowing water without the need for altering the course of the stream. The HydroKite™ is such a new idea that our IP covers the concept and its applications. Our first full-scale machine will be operational on the Fraser River in May 2014.

The HydroKite™ is designed with a long-run average cost of electricity of 12 ¢/kWH. This is one quarter the price of diesel generation dominating the off-grid market from Canada to The Congo. The HydroKite™ answers the call for renewable energy, without the key challenges hampering wind, solar power and tidal. HydroKite™ is dispatchable, hence fully compatible with traditional power utilities resisting further inroads by non-dispatchable power (e.g., solar and wind). HydroKite™ generation sites are close to existing transmission lines, eliminating the greatest barrier to expansion of new renewables. Unlike solar, wind and tidal power, HydroKite™ has a very high load factor permitting economic performance that is competitive with all dispatchable power without the need for subsidies.

The untapped potential for free-stream energy in North America is over 300TWh/yr. HydroKite™ offers an economically viable approach to harvest this energy while protecting stream and ecosystem integrity and without hindering other in-stream uses. The untapped potential equals the output of one million 40kW HydroKite™ units. We plan our first commercial deliveries in Q1 2015 and domination of this market.

HydroRun is a Canadian owned and operated company established in 2012 with offices in Vancouver and R&D facilities in Burnaby BC.

χ Kairama

Mike Jackson, CEO

Kairama is a pre-revenue technology venture focusing on refueling compressed natural gas (CNG) vehicles. Its patent-pending proprietary gas compression technology reduces the capital cost of vehicle refueling infrastructure by 2 to 4X compared with competitor solutions while also improving reliability and reducing space requirements.

The Kairama vehicle refueling appliance, which is modular and can be installed in general electrical areas by technicians without specialized training, uses a novel compression technology that can achieve the high pressures required for CNG vehicle refueling, while controlling the gas heating that drives cost up and reliability down in conventional compressors. Kairama's initial beachhead market of light-duty vehicle fleets in North America represents a $100M market opportunity today and is growing quickly with the widespread availability of inexpensive natural gas. Kairama expects that its technology will offer customers a three-year payback period on their investment in vehicle and refueling without subsidies, and may be brought to market as a financed package of vehicle and infrastructure for customers who commit to long-term fixed-price fuel purchase contracts.

We are working on a customer-funded feasibility study with support from FortisBC and four other members of the Canadian Gas Association. Kairama intends to outsource manufacturing and the experienced team has a successful track record of technology commercialization.

Andrew Bamber, Managing Director

Company Overview: MineSense™ Technologies Ltd is a B.C. based technology and marketing company with a passion for enhancing the sustainability of mining by improving the ore extraction and recovery process. MineSense provides a proven platform for the sensing and sorting of low-grade ore to a level of precision unprecedented in the industry.

Vision and goals: Our goal is to commercialize our advanced sensor technology by developing a standardized product suite, the MineSense Solution. By applying our pre-concentration methodology, the MineSense Solution can provide up to 20% margin enhancement due to decreased requirements for energy, water and chemicals.

Market Opportunity/ Customer Need: Global Mining is a trillion dollar business, and over $50B in North America. Economies of scale have run their course and there is increasing pressure from a combination of declining grade, increasing depth and footprint. Exploration and extraction costs have increased dramatically. Our telemetry-based solutions reduce waste, energy & footprint, increase revenues and margin. Our addressable market is over $1B annually.

Technology Solution: Our proprietary High Frequency Electromagnetic Spectrometry (HFEMS) and high speed x-ray fluorescent (HSXRF) sensors not only offer better sensitivity than sensors in other markets, but more importantly, they operate at high speeds which support real-time processing at commercially relevant throughput for the mining industry. These and other sensor modalities interface with our proprietary real-time analytics platform that processes sensor telemetry to make ore sorting decisions from 5mm particle resolution to 70m3 shovel scale. No other approach to sorting can meet industry needs. Pilot units are available today.

Business Model / Market Strategy: We sell complete solutions that embed our technology business-business, although channels are available. We charge a combination of deployment/ implementation fees and processing fees.

F. Phillip Abrary, President and CEO

Phosphorus is essential to all life, and a key macronutrient used to grow the food we need. However in excess, it can have negative consequences in our environment, causing algae blooms that destroy marine life and wreak economic havoc in the fishery and tourism industries.

Ostara's Pearl® nutrient recovery technology helps address these issues by recovering phosphorus and nitrogen from municipal and industrial wastewater streams and transforming them into a slow-release, eco-friendly fertilizer, which the company markets as Crystal Green®. Water treated at wastewater plants is rich in phosphorus and nitrogen. Unless managed, these nutrients build up as a concrete-like scale called struvite, clogging the pipes - reducing plant efficiency and requiring costly maintenance. Ostara's solution helps avoid struvite build-up, providing significant cost savings while helping wastewater treatment plants meet regulated nutrient discharge limits. Ostara operates seven nutrient recovery facilities in North America and Europe and has several projects in development including the largest nutrient recovery facility in the world in partnership with the Metropolitan Water Reclamation District of Greater Chicago.

Crystal Green is an innovation in fertilizer technology. It is the first Plant-Activated™ nutrient technology to offer slow-release nutrients sustainably made from a renewable source of phosphorus. Unlike conventional water-soluble fertilizers, Crystal Green releases nutrients in response to plant demand. As a result, it remains available to the plant three to four times longer than conventional fertilizers thereby offering more consistent delivery, greater fertilizer efficiency, lower application rates, and minimized nutrient loss, while reducing risks of leaching and runoff. Ostara's innovative cradle-to-cradle solution has the potential to impact global markets at a time when food security, fertilizer run-off, and environmental stewardship, are issues for communities everywhere.

Headquartered in Vancouver, Ostara is the recipient of numerous awards including the 2011 Technology Pioneer by the World Economic Forum, and being named to the Global Cleantech 100 for five consecutive years.

PARADIGM
ENVIRONMENTAL TECHNOLOGIES INC.

Gordon Skene, President and CEO

COMPANY OVERVIEW
Paradigm has developed a patented technology called “MicroSludge®”, which enables anaerobic digesters at municipal or industrial wastewater treatment plants (WWTPs) to work far better and to work far faster to convert sludge, a waste by-product, into biogas – a renewable source of energy.

MARKET OPPORTUNITY / CUSTOMER NEED
Paradigm’s addressable municipal and industrial market in North America alone exceeds $4bn. Market growth is driven by escalating municipal infrastructure costs; rising energy costs; increasing sludge disposal costs; and government policies that support clean energy or limit waste disposal options. World addressable market for MicroSludge exceeds $40bn.

TECHNOLOGY SOLUTION
MicroSludge avoids large capital expenditures (fewer digesters), increases revenues (more biogas), lowers operating costs (fewer digesters, lower disposal costs), and reduces GHG emissions.

MicroSludge patent includes USA, Canada, UK/Europe, China and India.
New complementary “Closing The Loop” process is patent pending.

EARLY COMMERCIAL STAGE
The Company has secured a $3.2m municipal order with Metro Vancouver. Paradigm has been operating a $6m demonstration at a major Canadian pulp & paper mill that is expected to lead to a sale in 2014. Paradigm is pursuing other prospective industrial and municipal customers.

COMPETITION
MicroSludge is ~50% lower cost than thermal hydrolysis, its primary competitor, and is viable in all sizes of municipal and industrial WWTPs, including small plants.

The new “Closing The Loop” process (patent pending) will give Paradigm a significant competitive advantage.

Ralf Edinger, CEO

Sulphur and nitrogen oxides (SOx and NOx) emitted in flue gas by large industrial facilities cause acid rain, low-level smog and, indirectly, alarming climate changes. To address these issues, regulatory bodies worldwide are changing environmental legislation to mandate reductions of these emissions. Consequently, industrial operations such as power facilities are forced to rethink their emission strategy. Within the energy sector, flue gas treatment systems are currently estimated at a $10 to $20 billion market.

With a successful track record of commercializing new technologies, PAVAC is entering this market with an economically sustainable solution called EBFGT (Electron Beam Flue Gas Treatment). This technology not only meets the changing environment protection targets, but also creates significant financial benefits. According to an independent study, PAVAC's solution reduces the capital cost by ~17%, and operating cost by ~19% compared to the conventional system, which uses a combination of Selective Catalyst Reduction (SCR) and Flue Gas Desulphurization (FGD) technology.

The EBFGT system utilizes PAVAC's electron-chemistry (e4chemistry) process to effectively convert SOx and NOx into fertilizer without creating waste streams. More importantly, EBFGT is the only flue gas treatment process that provides an additional revenue stream for the industrial facility: $16 million annual profits from fertilizer production for a 630 MW facility.

Currently, in partnership with Sustainable Development Technology Canada (SDTC), a PAVAC-EBFGT facility is under construction at a coal power plant located in the Canadian Prairies. Upon delivery of the project, PAVAC plans to install a full scale system at the power plant amounting between $48 to $80 million dollars. PAVAC's core EBFGT technology creates economic benefits unachievable by other flue gas treatment processes and, therefore, making environmental protection economically feasible.

Quadrogen®

Alakh Prasad, President and CEO

Founded in October 2007 in Vancouver, BC, Quadrogen is a privately held, clean-tech company that designs, builds, and installs high performance gas clean-up solutions for the renewable energy sector.

Quadrogen's innovative process can convert low grade biogas into a fuel of unrivalled purity, allowing it to be used in fuel cells, gas turbines, and reciprocating engines with high efficiency and reliability, while still costing substantially less than other biogas clean-up technologies (on a per-kWh basis)

Quadrogen's strategy is to spread the adoption of this technology by demonstrating the real world capability of its products, and the resulting benefits to its customers. In order to design, build, install, and service market-leading systems, Quadrogen maintains a small but highly experienced team, and forms partnerships with industry leaders in the technologies which interface with Quadrogen's products.

So far, Quadrogen has had the opportunity to demonstrate its technology in a ground breaking biogas cleanup system in Orange County, California. Our 300 kW flow-equivalent system was capable of reducing contaminants to the parts-per-billion level (existing systems could only accomplish parts-per-million purity), exceeding the customers stringent requirements. The system has been operating well since June 2011, allowing Orange County to run its biogas power generation system with unprecedented reliability. More recently, Quadrogen has begun a new project in Delta, BC, which is to be the world's first system capable of converting raw landfill gas into renewable electricity, heat, and commercial grade hydrogen and CO2.

S2G BioChem
SUSTAINABLE CHEMICAL SOLUTIONS

Mark Kirby, President

S2G Biochemical Inc. (S2G) has developed an environmentally friendly, proprietary process that converts low cost byproducts, such as glycerine and biomass sugar, into high-value biochemical glycols. The $25 billion market is currently dominated by petrochemical glycols but is associated with problems such as environmental degradation, increasing costs, along with price and supply volatility. With reduced GHG emissions and lower costs, S2G's clean technology is shifting this status to a sustainable and secure alternative. Its drop-in replacement is chemically identical but derived from a range of byproduct feedstock. This advantage offers insulation from oil-related price swings and supply stability.

Commercialization is underway through a series of JV projects with strategic partners who provide capital, feedstock and market channels. The technology's first generation was commercialized by a Chinese licensee in 2006. In Vancouver, Canada, a $6 million pilot plant has been in operation since November, 2012 demonstrating advances and the technology's ability to use a variety of partner feedstocks. These successes place S2G in the lead in key enabling conversion technologies.

Building on this base to establish additional commercial plants, S2G signed a JD agreement with a Fortune 100 consumer products company that has identified strategic cost and market advantages in using this technology. S2G also has an MOU to commercialize with the leading US biofuel technology company. Foundational strategic partners include a number of equity holders: IPCI, (technology founder), Sacré-Davey Engineering and HTEC Hydrogen.

The global glycol market is growing rapidly. S2G is well positioned to take advantage of this demand and will, with its strategic partners, see two new commercial plants operating within the next three years. Pipeline projects include additional JV's to co-locate plants near byproduct feedstock sources such as sugar mills, biodiesel plants or pulp mills. These initiatives will generate $100+ million revenue for S2G in five years.

Michael Gilbert, President and CEO

Founded in 2010, Semios is a leading developer of Precision Crop Management Solutions for the agricultural industry. Semios initially developed its proprietary system to enable growers to adopt bio-pesticides to control pests, which growers are actively pursuing as a safe alternative to pesticides. The approval of alternatives is being fast tracked due to increasing regulation and outright bans of pesticides. Notably the EU has banned 22 agricultural pesticides and mandated integrated pest management (IPM) strategies.

The Semios network of remote sensors, traps, cameras, weather stations and pheromone (bio-pesticide) aerosol dispensers are wirelessly connected to a central gateway. The gateway provides real time information on all measured variables to a cloud database which is then analyzed, organized and provided to the end-user via stationary and mobile devices including desktops, laptops, and tablets. This information is used to automatically optimize the application of pheromones and to provide information to the grower to manage other agricultural inputs.

Semios has now secured its first commercial-scale purchase orders for 2014 and the order pipeline has grown to over 5,000 acres. This market traction is based on compelling data from over three years of testing across more than 3,000 acres. Among their clients, they count the top apple growers in Washington State, and sales are expected in Europe and South America in 2014.

Frank Christiaens, CEO

When the sun shines, buildings receive more sunlight throughout the day than is required for lighting. People simply prefer sunlight. Electric lighting is designed to recreate sunlight but cannot effectively match its quality and spectrum. In addition, up to 26% of all electricity in buildings is used for lighting. Building design limits the ability for daylight to reach the majority of spaces used by building occupants.

Currently, skylights and skytubes are the main methods used to bring natural daylight into building interiors. These solutions are limited to single-storey buildings or the top floor of a building. Skylights can also introduce glare and thermal discomfort to building occupants. SunCentral has developed a unique method of daylighting which overcomes these limitations.

In July 2013, SunCentral launched their SunBeamer™ and SunCentral System™ products into the commercial market. The SunBeamer™ tracks the sun autonomously, transmitting a stationary, collimated beam of sunlight downward throughout the day. This can be implemented in skylights, atria or with tubular devices to deliver glare-free, full spectrum sunlight anywhere within a building. The SunCentral System™ utilizes the SunBeamer™ as its tracking component. Mounted at the roof level on any side of a building, the SunBeamer™ transmits sunlight through air to our modified SunShade™ and SunSpandrel™ package, where it is concentrated and piped into the building up to 50 feet via our SunLuminaire™ light fixture. The SunLuminaire™ has integrated LED lighting which automatically adjusts to the level of sunlight available. These unique products surpass traditional daylighting methods by delivering full-spectrum, glare-free sunlight to the core areas of multi-storey buildings.

SunCentral recently established their new US headquarters in Santa Clara, California. The company is focused on further developing the capability and design of their unique products to ensure market growth and increased awareness of the benefits and advantages of daylighting.

Victor Krahn, President and Co-founder

Key Objectives
The key objective of SunSelect is to provide high quality, year round consistent greenhouse vegetable production to the top retailers in North America to achieve the best return to the producer. This objective is attained by a strategy of producing the full range of produce requested by retailers from multiple locations in North America as well as teaming up with a large distribution and marketing agent in Oppenheimer which maintains strategic grower supplier relationships. The combination of SunSelect's existing and expansion facilities and the key relationship with Oppenheimer meets a key objective of providing year round supply to SunSelect's major, top customers. From an operational perspective, SunSelect's objectives include maintaining a low cost of production through strict management of input costs including labor and energy. SunSelect will strive to utilize innovative solutions to continue to keep its energy and production costs competitive.

A key to achieving the objectives of SunSelect is to maintain a strong balance sheet with a view towards providing our investors and financing partners with superior investment stability, consistency and returns.

Innovation
SunSelect has a history of expansion and innovation. SunSelect was one of the first producers to utilize biomass as an alternative source of energy for heating its greenhouse facilities. SunSelect, with the assistance of government obtained grants and funding, is the first producer in the world to be able to capture carbon dioxide from biomass consumption for use in the greenhouses as a source of carbon dioxide to enhance plant growth. SunSelect was also the first greenhouse producer to monetize and verify carbon credits in its production facilities.

Bruce Gray, CEO

SunPump - First Solar Heating That Pays For Itself.

Solaris is a BC Company that is launching a highly acclaimed solar heating technology to change the way buildings are heated by making solar cost less than fossil fuels. Green Building in North America is a high growth $50 Billion market1 in 2014, driven by the serious Global Climate Change problems it will double to $100 Billion in the next 2 years.

For Designers, our disruptive technology is called SunPump, which is short for Solar Source Heat Pump that is a patented 3-part multi-source combination or Air Source, Ground Source, and Solar Source Heat pumps. This hybrid innovation allows SunPump to move energy from the most optimal heat source; air, ground, or solar; so it can operate all day, every day, in the winter, even in the dark. As the first solar heating system to operate 24/7, with CSA/UL certification and integrated backup heater, SunPump will experience exponential growth as it fills the void and demand for a primary, stand-alone heating system based solely on cost. The fact that SunPump is renewable energy is secondary, it will compete on par or less than the cost of incumbent fossil fuels and electric heating, and less than half the cost of comparable renewable Geothermal or Solar PV.

For Builders, Solaris leverages the convergence of our high performance SunPump product, and the top Business Model using the No Money Down Lease, proven by Sun Edison. Solaris is introducing the first Solar Heating Lease that removes the barrier of high upfront cost. Leasing gives Builders and renovators a Zero-upfront SunPump, eliminating heating equipment costs that can be reallocated to envelope improvements. A Leased SunPump results in a building that achieves higher EnerGuide ratings, increased business margins and building value2, and faster selling time2. Contact Bruce Gray to discuss your project.

(1McGraw Hill)
(2NREL)

Doug Wiggin, CEO

The use of large glass areas to create light and airy spaces is a growing trend in both automotive and architectural design. However unwanted side-effects that impact energy use, occupant comfort and safety include high solar heat gain leading to excessive use of air conditioning and the need for cumbersome and costly shading systems to control glare. While low-e coatings help to reduce the heat from the near infra-red portion of the solar spectrum, they do little to impact the nearly 50% of the sun's energy that comes in the form of visible light. SWITCH Materials' Active Control interlayer technology is a film-based solution that enables dynamic control over the amount of light entering a vehicle or building. SWITCH film darkens automatically in the presence of sunlight but can be returned to the clear state with the application of low voltage electricity. The result is a window that can be controlled by the user to allow for the optimal amount of light under differing conditions.

The first market for SWITCH Active Control film will be in the automotive sector where the reduction in the use of air conditioning translates to a 2.6% increase in gasoline fuel economy or a 3.5% improvement in electric vehicle range. SWITCH is in an advanced pre-commercial development phase and is currently working with several primary glass manufacturers and tier one automotive suppliers to produce prototype parts cou pled to vehicle launches for the 2017 model year. Evaluation and specification programs began with select automotive manufacturers in 2013, and additional ones will be undertaken in 2014. Beyond automotive, SWITCH Active Control film has exciting opportunities in architectural and other markets.

Notes

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