
we put solar to work™
carmanah®

Overview

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As one of the world's most trusted names in solar technology, Carmanah has earned a respected reputation for delivering innovative, cost-effective and long-lasting solar products for the marine, aviation, traffic and industrial markets.

Carmanah's Mission:

We deliver stand-alone solar lighting and solar power systems for industrial applications, worldwide.

Strategic Objectives:

1. Build strategic customer relationships
2. Enhance the customer's experience
3. Create a winning, risk-taking culture
4. Be the market leader in industrial, stand-alone solar lighting and power systems
5. Build R&D capabilities and partnerships

With strong leadership and clear direction, Carmanah delivers its technology through a range of strategic and tactical businesses.

The solar-powered, economically-viable products and technologies that Carmanah manufactures and distributes make an immediate and significant impact in peoples' lives. Applying these core strengths, Carmanah is putting solar to work and providing real solutions that meet real needs.

Business Sectors:

Strategic Businesses

These units will be Carmanah's main, long-term focus:

- Solar LED Lights
  - Marine
  - Aviation
  - Obstruction
  - Traffic
  - General Illumination
- Off-Grid Solar Power Systems
  - Telecommunications
  - Oil & Gas
  - Security
- Canadian Grid-Tie

Tactical Businesses

These units are important today and considered to be stand-alone growth opportunities:

- Mobile power for recreational and utility vehicles
- Energy-efficient edge-lit signage

Strategic Partnerships:

International Distributor Network

Carmanah's network of representatives spans the globe. Carmanah carefully seeks out distributors who have a proven reputation for performance and service. From North America to Africa to Australia, Carmanah is able to provide customers with a knowledgeable, responsive representative in their country who can provide them with top quality customer service.

Solar LED Lighting

Carmanah's suite of solar LED lighting systems provide energy-efficient solutions for marine, aviation, traffic, general lighting and industrial worksite applications. Whether cost, location, or simply the opportunity to make a "green" choice drives a decision to choose solar – Carmanah provides the solutions to meet a full range of safety and hazard-marking challenges that significantly reduce total cost of ownership.

Solar Marine Lanterns

In 1996 Carmanah revolutionized the aids-to-navigation industry with its compact, fully integrated 1-nautical-mile solar LED marine lantern. Ongoing innovation has produced a range of models with different visibilities and functions. Today, producing a minimum peak intensity of 125 candela at the highest intensity setting, and performance up to 6-nautical-miles, Carmanah's solar-powered LED marine lanterns are used extensively by ports, harbours, coast guards and marine authorities around the world.

The Carmanah Advantage:

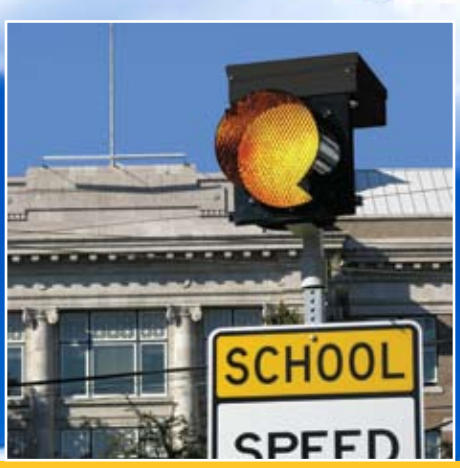
- **Significant cost savings:** a five year maintenance cycle means fewer hours and less resources are required to maintain and service aids-to-navigation systems.
- **Engineered to perform:** lanterns meet or exceed performance recommendations made by industry organizations such as IALA, IMO, and NEMA.
- **Robust, compact and fully integrated:** IP68 waterproof rating, shock resistant and vandal resistant.

Solar Airfield Lights

Carmanah solar-powered LED aviation lights are trusted by commercial, defence and private airfields worldwide to perform in some of the harshest operating conditions on Earth. From ease of installation to versatility of operation, Carmanah's solar LED airfield lights offer significant advantages over conventional systems, without sacrificing quality, safety or operational efficiency. Carmanah lights are suitable for runway lighting, taxiway lighting, helipad lighting, barricade and obstruction lighting, elevated runway guard lighting, windsock lighting, and emergency lighting.

The Carmanah Advantage:

- **Cost-effective installation:** no trenching, cabling or specialized work-crew required, and minimal disruption to airfield operations.
- **Easily relocated:** ideal for temporary use during an emergency, unexpected runway closure, or runway construction.
- **User configurable:** Available with infrared capability and wireless functionality, lights can be configured to suit the exact application for which they are installed.



Solar Obstruction Lights

Lighting applications for mining, rail, tower and construction marking demand high performance and rugged reliability. Carmanah solar obstruction lights offer a dependable solution for marking fixed obstructions and hazards in low solar conditions, high latitudes and extreme temperatures. Operating independently from the electrical grid, Carmanah solar obstruction lights are immune to electrical grid outages and power surges, providing a safer, more reliable solution in a way that hardwired alternatives cannot.

The Carmanah Advantage:

- **Cost-effective operation:** a solar supply means no grid connection, electricity or fuel costs. Lightweight, compact units are easy to install and require minimal technical expertise.
- **Deploy and forget:** once installed there is no scheduled maintenance or servicing for up to five years, and no light bulb changes ever. This means improved safety at a lower cost.
- **Rugged reliability:** compact, robust design is ideally suited for remote and difficult to access industrial lighting applications.

Solar Flashing Traffic Beacons

For roadway infrastructures where grid-based power is unavailable, unreliable, or too costly to access, Carmanah solar LED warning flashers, solar power systems, and LED signage are a reliable alternative. Ideal for urban and rural settings, Carmanah traffic products include solar- pedestrian and 24-hour flashing beacons, programmable solar school-zone flashers, and stand-alone power sources for Intelligent Transportation Systems (ITS) equipment.

The Carmanah Advantage:

- **Overall cost savings:** up to five years of reliable operation without scheduled maintenance or servicing.
- **Hassle-free, low-cost installation:** easy retrofit onto existing sign posts. No trenching, cabling, electrical grid connection or permits required.
- **Flexible design:** enables any configuration of single, dual or bi-directional dual flashers.

Solar Area Lighting

Effective area lighting is essential for maintaining nighttime safety and security of park areas, bike and pedestrian, pathways, and perimeter/ security lighting for industrial installations. The EverGEN™ solar area lighting solution combines Carmanah award winning solar technology with state of the art LED luminaires, to deliver a versatile and adaptable pedestrian scale lighting application. Ideal for locations where the optimal placement may be impractical or impossible for a traditional hardwired connection, the EverGEN™ solar area lighting solution offers a convenient, affordable and environmentally friendly way to add outdoor area lighting anywhere, anytime for an almost limitless number of applications.

The Carmanah Advantage:

- **Cost-effective:** compact, stand-alone system installs without trenching, cabling, electrical grid connection or expensive permits.
- **Robust Design:** Blackout-proof, low-maintenance and vandal-resistant for high-security area lighting.
- **Eco-friendly:** solar area lighting showcases sustainable infrastructure and can qualify an agency for LEED® renewable energy credits.

Solar Power Systems

Carmanah solar power systems offer a wide range of renewable energy system solutions for industrial and commercial applications. Solar power makes it possible to install and operate equipment at isolated locations, often at a fraction of the total cost of ownership associated with a fuel-based generator. With more than 20 years' experience in remote solar power systems design, and expertise in meeting the unique operational demands of its clients, Carmanah has designed and manufactured solar solutions that operate flawlessly in even the most extreme environments.

Canadian Grid-Tie Solar Power Systems

As one of North America's largest and most trusted solar technology integrators, Carmanah has designed and installed more commercial grid-tie photovoltaic systems in Canada than any other organization. Carmanah designed and installed the two largest solar power systems in Canada: a 108kW system for the Jean Canfield Building in Charlottetown, PEI, and a 100kW system for Exhibition Place in Toronto, Ontario. The system at Exhibition Place is expected to reduce the facility's annual carbon dioxide emissions by approximately 94.7 tonnes per year and produce about 120 megawatt-hours of electricity yearly: enough energy to run 15 average size homes.

The Carmanah Advantage:

- **Long-term investment:** where grid-based power is available or connected, a solar power system can supplement electricity requirements and reduce monthly energy bills. Where net metering is available, surplus power can be fed back into the utility as credit.
- **Eco-friendly:** reducing the use of conventional electricity will significantly reduce greenhouse gas emissions.
- **Customizable:** ability to create a customized grid-tie solution that meets exacting needs.

Off-Grid Solar Power Systems

Carmanah off-grid solar power systems provide a source of clean, reliable energy to power critical systems with confidence. From cathodic protection, to SCADA systems and telecommunication towers, Carmanah solar technology can be configured to run a variety of equipment without connection to the electrical grid or generators. With an adaptable design, Carmanah solar power solutions can also be sized for hybrid power systems, integrating easily with additional sources of power generation including diesel, fuel cell and wind generator energy sources. Offering significant cost-saving benefits, and backed by experience that spans the globe, Carmanah solar power systems are an ideal choice for powering essential equipment in areas where conventional power is unreliable, unavailable or unaffordable.

Telecommunications

Carmanah has extensive experience in designing solar electric systems for telecommunication applications, including mountain-top repeater sites, microwave relays, and portable radio power systems. With networks of mountain-top repeaters accessible only by helicopter, site reliability is critical. Carmanah solar power systems require little to no ongoing maintenance, making them a reliable, ideal alternative to generator or potash battery systems.

Oil and Gas

The oil and gas industry frequently faces the challenge of providing power to remote areas in hazardous environments; Carmanah solar engines are available with c CSA ul Class I, Div II approval for remote and hazardous locations. Common applications include SCADA monitoring stations, cathodic protection for pipelines, and mineral exploration camps.

Security

Carmanah solar power systems for security applications provide more reliable measures of safety in remote or difficult to access locations. Carmanah solar power systems are the ideal power solution for remote security applications such as video surveillance, highway monitoring equipment, homeland security, security lighting, perimeter monitoring, and many other applications.

The Carmanah Advantage:

- **Cost-effective**: a completely self-sufficent solution that can significantly reduce fuel and maintenance costs and increase system reliability.
- **ISA-approved:** available with Class I, Div II certification, Carmanah solar power systems can be configured for hazardous environments.
- **Industrial strength build quality:** designed to perform reliably in ambient temperatures from desert heat to arctic cold for dependable, worry-free operation. All components are chosen for maximum compatibility and are ideally suited for specific power needs, environment, and geographic location.

DuraGEN™ Off-Grid Solar Engine

The DuraGEN™ family of solar engines provides a complete, stand-alone solar power supply, ideal for applications requiring less than 500 watts of peak solar power. For quick, efficient installation, each DuraGEN™ solar engine comes as a complete, ready-to-install system. A flexible design allows a steady flow of clean, high quality, dependable power to run a variety of third-party equipment with confidence. For oil and gas applications, the DuraGEN™ is available with c CSA ul Class I, Div II approval.







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Carmanah's solar technology has become synonymous with quality and performance. Backed by more than twenty years of experience in the solar industry, Carmanah's products are field proven to endure the world's most demanding environments. From its global headquarters in Victoria, British Columbia, Canada, Carmanah oversees a network of sales representatives and distributors that spans the globe. With diverse applications ranging from traffic, marine and aviation to obstruction marking and industrial uses, Carmanah's technology continues to set the standard for the solar industry.

Carmanah is a publicly traded company, with common shares listed on the Toronto Stock Exchange under the symbol "CMH".
For more information, visit carmanah.com.

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Document: CORP_Brochure_RevC