Looking forward to the next 20 years

A leading global supplier of solar charge controllers and inverters, Morningstar Corporation has been at the forefront of innovation, technical excellence and customer service for over two decades. We caught up with Lee Gordon, the company’s President and CEO, to ask him about his views on the industry and to discover just how he’s managed to help steer such a steady course for so long.

PES: Welcome to PES magazine. Would you like to introduce the company to our readers and explain how you serve the PV industry?

Lee Gordon: Morningstar Corporation is a world-leading supplier of off-grid solar charge controllers and inverters – with over two million units installed, in over 111 countries around the world. Our products are generally installed in off-grid sites where mains power is not readily available and the power requirements are relatively modest. Typical applications include telecommunications, oil/gas telemetry, security systems, lighting, marine/mobile systems and rural electrification.

Morningstar is renowned for delivering the industry’s best overall customer value. Our controllers and inverters have set new standards in performance, innovative features, quality and reliability. Our products are manufactured in a fully automated world-class ISO 9001 facility. Our Quality Control includes 100% functional testing on every product, using the latest computerised test equipment and processes.

Morningstar’s products are marketed through 230 highly qualified distributors in 89 countries. Our authorised distributors are typically the leading solar distributors in their respective country.

PES: Just how competitive is your corner of the solar/PV market? And similarly, what’s your on-the-ground assessment of sector growth in Europe?

LG: Off-grid charge controllers and inverters are highly competitive, like most all of the PV market. But Morningstar’s market positioning is as a long-term, dependable supplier/partner providing higher quality, reliability and performance. This distinguishes Morningstar from our competitors, who often compete with low prices and low quality products, and often exit the market after only a few years in business.

Since the charge controller is typically less than 10% of the overall PV system costs, it is very cost-effective to pay a slightly higher price for a reliable product and avoid very expensive trips to remote sites to repair or replace a failed controller. One trip to the field would be much more expensive than the incremental cost of a high quality charge controller and would avoid power interruption to critical load equipment.

Sector growth in Europe has been only 5-10% per year due to the focus on the grid-tie market and the sluggish economy. Our European customers also purchase Morningstar products for re-exporting to Africa and the Middle East.

PES: The company has been established for 20 years. Can you give us an example of how the market has evolved over that time?

LG: Over the past 20 years, the PV market has changed considerably. In particular, the price of PV has decreased dramatically, and the market has shifted from primarily...
off-grid systems to primarily grid-tie systems. In the process, many industry players have come and gone, and there have been many new entrants recently. The industry is presently undergoing a major consolidation, and has been greatly impacted by low cost Chinese PV modules.

In these challenging times, it is most important for customers to select suppliers who are long-term, dependable industry leaders, who are strong financially and who will be here for many years in the future. Morningstar is just such a company and I believe this is one of the reasons our customers consider us to be their first choice when selecting a solar charge controller.

**PES:** You’re the global solar charge controller and inverter leaders. What steps do you take to ensure that you maintain that position?

**LG:** Morningstar is the global solar charge controller leader, but certainly not the solar inverter leader (which is dominated by grid-tie inverters). In order to maintain our position of charge controller leadership, we need to continue to develop highly innovative new products that better meet our customer needs at a competitive price. This requires a significant investment in research and development, a deep knowledge of power electronics, and an understanding of our customer’s needs when deploying off-grid PV systems in some of the world’s most challenging environments.

Furthermore, customers expect and deserve to be supported for the long-term. Our customers tell us that Morningstar has among the best technical and marketing support in PV, providing timely responses within 24 hours and excellent technical documentation. In the end, I believe it comes down to listening to your customers, being responsive and developing a long-term relationship built on trust and integrity.

**PES:** Your products are installed in a wide range of environments worldwide. What steps do you take to ensure their longevity?

**LG:** Morningstar’s products are oftentimes installed in harsh environments, including jungles, mountaintops, deserts or coastlines, and in temperature extremes from equatorial regions to Arctic locations. Designing products to survive such difficult environments is a real challenge. Morningstar has been doing this for 20+ years and we have learned many lessons over the years. We have also visited many of these remote locations so that our designers can fully appreciate the requirements of our customers and the need for high reliability under extreme weather conditions.

Morningstar’s products include many features for protection against harsh environments. For example, our SunSaver controller has epoxy encapsulation which completely covers our printed circuit boards and prevents humidity from causing the damaging effects of corrosion of electronic components. Meanwhile, our ProStar controller has conformal coating to seal the printed circuit boards from the environment.

Furthermore, all Morningstar products include advanced thermal designs to minimise heating even in equatorial site locations. For example, our TriStar controller has a large heat sink and a fan-less convection cooling design that draws heat away from the power electronics and allows us to rate this unit to up to 85°C without damage to the controller.

**PES:** We’re intrigued by your recent counterfeit campaign. Can you tell us a little about it?

**LG:** During the last several years, Morningstar has seen low cost, low quality solar charge controllers entering the market from Asian suppliers. As long as these suppliers do business ethically and do not misrepresented their products, we have no problem with this as we all have to compete in an increasingly competitive global marketplace.

However, we do have a problem when a company copies or reverse-engineers someone else’s products, steals intellectual property and is untruthful about product specifications. For Morningstar, we have identified one Chinese supplier selling counterfeit Morningstar products and marketing these as authentic Morningstar products.

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However, we do have a problem when a company copies or reverse-engineers someone else’s products, steals intellectual property and is untruthful about product specifications. For Morningstar, we have identified one Chinese supplier selling counterfeit Morningstar products and marketing these as authentic Morningstar
controllers. This is totally unacceptable, and will most-likely result in safety and performance problems for unknowing end-users.

In order to combat this unethical behavior, Morningstar has initiated a counterfeit campaign in which we are working closely with both U.S. and Chinese governmental authorities to close this illegal factory and to prevent the exporting of these products from China. Furthermore, we are monitoring websites for counterfeit products and working with our global customers to help us identify any suspicious activity.

PES: The organisation operates in a number of worldwide territories – how do you ensure consistency of service?

LG: Morningstar’s products are marketed through 230 highly qualified distributors in 89 countries. Our authorised distributors are typically the leading solar distributors in their respective country and have typically been in the off-grid PV business for many years.

Furthermore, we have a long-term, consistent distribution strategy and many authorised Morningstar distributors have been selling our product for over ten years.

Therefore, our distributors have come to know our products well, and are able to ensure consistent, high quality service to our customers. Morningstar also provides training programs to our distributors and their dealer/installers, and writes detailed operation manuals and technical papers in five languages. All of this helps to ensure consistent service across seven continents around the world.

PES: Can you tell us a little about the benefits of using open communication protocols and interfaces in your products?

LG: Morningstar’s products use MODBUS, which is an open communications protocol. This facilitates easy interfacing between Morningstar products and other non-Morningstar equipment in the system. This is a tremendous benefit since the interoperability of all the equipment in a system is needed for optimal performance.

Several of Morningstar’s competitors have designed proprietary protocols to help them to sell more of their own equipment. This creates a problem for the customer since often times this approach may limit the customer’s choice in their equipment selection and increase their overall cost of system integration.

PES: The investment required to launch a new product can be considerable. What processes do you go through to assess the viability of this investment?

LG: Morningstar begins with a careful market and customer assessment, and tries to assess unmet customer needs and
relative market size. We then discuss the market opportunity with our talented power electronics designers and explore potential technical innovations that would bring a high value to the target customer base. Since the investment required for any new product is considerable, we must estimate our return on investment before proceeding with any development project.

Morningstar’s approach has yielded some impressive results.

For example, in 1995 we introduced our ProStar controller, which was the first PV controller with a PWM (Pulse Width Modulation) charging algorithm. PWM vastly improves battery charging and results in increased battery capacity and useful life. I am proud to say that since this Morningstar innovation, the global PV community has accepted the superiority of PWM battery charging.

In another innovation in 2008, we developed and patented our TrakStar MPPT technology, which is an advanced control algorithm used in our TriStar MPPT and SunSaver MPPT controllers. TrakStar maximises the energy harvest from the solar array into the batteries, under all operating conditions, and has resulted in the TriStar MPPT controller becoming the world’s leading MPPT solar charge controller.

PES: What are your thoughts about prospects for the coming year with regard to your organisation, and the solar/PV industry in general?

LG: The coming year will present many challenges to the PV industry, including PV module overcapacity and irrational pricing, trade wars and consolidation. However, I believe this is a just a ‘bump in the road’ towards healthy growth and long-term industry stability. Unfortunately, it will be painful for many good and passionate people who may lose their jobs through no fault of their own.

In the medium- and long-term, those making rational business decisions will survive and prosper. I believe Morningstar will be one of those survivors, as we have a strong global brand, high value innovative products and an impressive team of professionals who are passionate about PV. These past 20 years, since Morningstar’s start, have been an exciting and successful journey and I am looking forward to the next 20 years!