

Our First Three Decades

Yearbook 2023





Looking Back: The First Three Decades

At the time when Morningstar co-founders Ken Gerken and Lee Gordon were laying the groundwork for a second successful start-up, solar energy was a field belonging to visionaries. Fossil fuel prices were sinking, a recession was looming, and early solar panel technology was still clawing its way toward that magic 10% efficiency milestone.

Fortunately for the emerging solar industry in 1993, both these pioneers were willing to place a strategic bet on solar and started Morningstar Corporation anyway. The new company went on to set standards, break records, and establish benchmarks which stand some 30 years later: over four million products sold and used in mission-critical installations across diverse industry sectors, well over 100 distributors on six continents, and the highest reliability rate in the industry.



With some three decades of consistent, independent ownership and management behind it, Morningstar today enjoys stability and staying power unique in the industry—a result of the high morale, independent culture carefully cultivated by its founders and their original vision.

Thriving on rock-solid stability and radical change



Power & Energy Solutions Solar (PES), a high-profile UK renewables magazine, interviewed Lee Gordon on the eve of Morningstar's new product launches in fall 2022. An excerpt from it:

PES: Can you share the secret behind Morningstar's ability to maintain an industry-leading reputation for nearly 30 years now?"

Lee Gordon: Of course, but truthfully it's not much of a secret. If you have built the best culture you can, and remain absolutely committed to both your customers and your people, you keep the best people and your customers keep their confidence and loyalty in you. The main ingredients of any "secret sauce" in our brand are consistent management and independence. One can't overestimate how important they are.

PES: Please expand on that Lee.

Lee Gordon: On independence, that's simple— we don't answer to a parent company or investment firms, unlike some of our competitors. Our stability is a product of employee ownership, because our people remain truly vested in the brand and its success and they remain with us. We enjoy high morale and unprecedentedly low turnover as a result.

Excellence as a direct result of employee ownership and independence is a bit more complex, but it's actually a source of our products' differentiation and competitive advantages. We can design to higher standards because

we don't have to answer to an externally-mandated bottom line. When you don't have someone standing over you insisting that you cut corners, you simply can design and build better.

PES: How do you apply those values every day at Morningstar?

Lee Gordon: They go beyond engineering and manufacturing—when employees are owners, they feel that their own reputations ship with every product and they dedicate themselves to ensure that all customers are highly satisfied with them. It also goes well beyond the initial sale—our customer surveys consistently show them grading Morningstar their top brand in terms of customer support.

Stability that comes from consistent management and the excellence we achieve through employee ownership are on full display in the our products. Being "customer-driven" is no catch-phrase at Morningstar. Our stability has enabled us to build unusually long and deep relationships with our customers, and our excellence through employee ownership helps maintain them. It is fundamental to who we are, what we build, and how we build it.

Founded
1993



1995



ProStar™ Controller:

Morningstar introduces its mid-range solar controllers for both professional and consumer applications, the first milestone in a legendary history of design and performance

1996



SunSaver™ Controller:

In what will become the "single most successful charge controller in the solar industry," the SunSaver is introduced for oil & gas operations and other industrial applications around the globe

1997



Patent awarded for a highly effective battery charging algorithm, based on true PWM switching & constant voltage charging



Timeline

For three decades Morningstar has built its reputation on industry-leading dependability and performance. The result: over four million Morningstar products sold, serving in mission-critical applications in over 100 countries— on mountaintops, deserts, at sea, even at the North and South poles.

Morningstar solar components are the first choice for the world's leading off-grid professionals because we've proven ourselves to them over and over again, with products that set performance standards even under the most challenging conditions.





Two of the most significant new products in Morningstar's history mark our 30th Anniversary year

In September 2022 Morningstar debuted two product milestones at RE+/Solar Power International, the largest solar event in North America: GenStar™, a high-end DC charging system, and a complete line of SureSine off-grid DC/AC inverters. Either one would generate considerable buzz throughout the solar industry on its own. Together, they set both a milestone and a new direction for our brand, for two reasons.

The first being that Morningstar is regarded throughout the off-grid solar world as the leader in solar charging technology, and has been since the company's inception in 1993. For Morningstar to introduce an all-new charging system loaded with revolutionary features and capabilities is something that truly deserves the term "breakthrough."

Second, for almost as long as Morningstar has been the leader in solar charge controllers, Morningstar's customers have longed for off-grid inverters with the same industry-leading quality and durability, to ensure that the systems they design and install have no weak links and can truly be "Morningstar throughout." The company's all-new SureSine line is precisely engineered to meet their needs, and firmly establishes Morningstar as a complete systems solution provider.

Bill Mellema, Director of Product Management, led the effort that led to GenStar, while Jim McGrath, Director of Sales, drove the inverter project as a response to customer demand. At RE+ they shared their perspectives on Morningstar's new products for the international solar press:

1999



SunLight™ Controller:
for street, transportation station, pathway and signage lighting and more. Ten lighting options with onboard timer

SunGuard™ Compact Controller:
for microsystems, rugged enough for commercial use

2001



ProStar™ (GEN 2) Controller:
the next generation of ProStar includes new features and protections

NEWS Products

2003



TriStar™ Controller:
a 3-Function solar charge controller for larger systems, providing reliable PWM solar battery charging or load control or diversion regulation. TriStar will become the most iconic controller design in the off-grid solar industry, setting standards for others

2004



SHS™ Controller:
A low-cost controller ideal for Solar Home Systems and rural electrification



Patent awarded for our innovative industrial-grade 3-function solar charge controller for larger systems, providing reliable PWM solar battery charging or load control or diversion regulation

SureSine
SINE WAVE INVERTER



Jim McGrath: we didn't just decide to "get into the inverter business" — it was our customers who got us into it, after decades of high expectations set by our solar charge controllers. We always heard requests for off-grid inverters built to the same level of quality and craftsmanship along with their wish list of what a "Morningstar of inverters" would have for innovative features and capabilities.

That's no off-the-shelf type of product. The new SureSine inverters are the polar opposite of "me too" thinking, starting with superior industrial-grade build quality since so many of our customers are focused on that segment and have mission-critical applications requiring critical power solutions. We gave SureSine the foundation of a premium toroidal low-frequency transformer for improved sinewave stability and superior power quality. Next, we added full communications capabilities, including USB, Ethernet, EIA-485, CANBUS, and Bluetooth for wireless communications. That includes wireless Android and iOS utility apps for set-up and monitoring our inverters using remote devices.

We also designed-in multiple AC and DC voltage choices along with NRTL safety, noise and performance certifications to make SureSine a true world product. Most important, our customers wanted a best-in-class "Morningstar of inverters" to seamlessly integrate with the Morningstar charge controllers they've come to depend on. SureSine is engineered for system-level integration, communication and interoperability with Morningstar's legacy charge controller line as well as the revolutionary new GenStar.

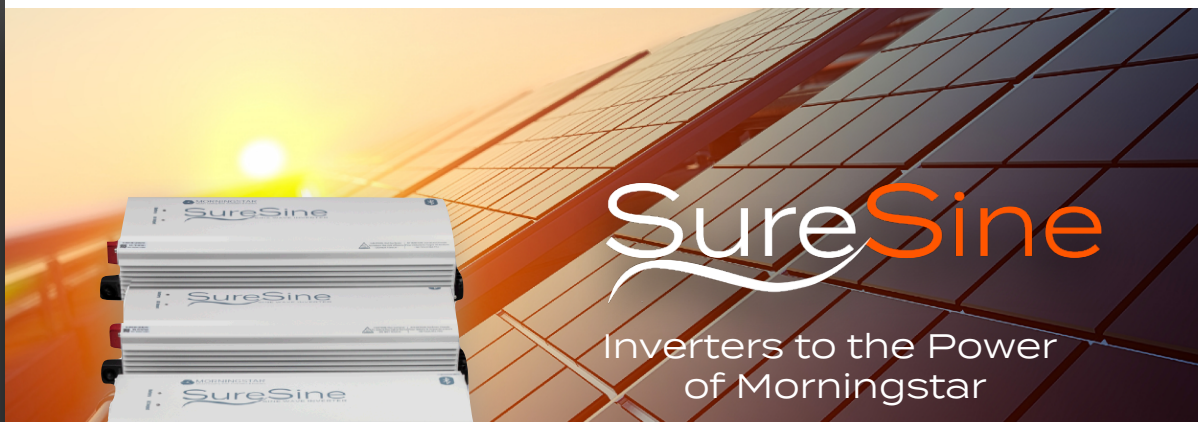
MORNINGSTAR
PROFESSIONAL SERIES
WORLD'S LEADING SOLAR CONTROLLERS & INVERTERS

As seen in:

SOLAR
BUILDER

Solar
Power World

pv magazine



SureSine

Inverters to the Power
of Morningstar



With over 1,600 off-grid inverters* already on the market from our competitors, we had to make sure that our six new ones raised the bar. Meet the result.

Our new SureSine inverters start with the industrial-grade “over build” quality and precision engineering that made Morningstar the industry leader in off-grid solar over the past three decades. Next, we added our customers’ wish list of inverter features and technologies. Finally, we designed-in the performance and safety needed to achieve industry-leading NRTL conformance certifications—unique in this class of inverters.

SureSine is the inverter line our customers asked us to build. And our competitors will wish we hadn’t. Multiple DC/AC configurations means there’s a SureSine ideal for your next project. Contact Morningstar to learn more www.morningstarcorp.com.

Simple Network Management Protocol
SNMP
COMPATIBLE



*source: ENF Solar industry company
and product directory 2022 <https://www.enfsolar.com/pv/inverter>

- Six all-new inverter models from 150 to 2500 Watts; 120 or 230V output, 12, 24 or 48V DC input options
- Superior industrial-grade design “over built” in the Morningstar tradition, including a low-frequency toroidal transformer for improved sinewave stability
- Engineered for system-level integration with Morningstar charge controllers
- Full communications capabilities: Bluetooth, RS-485, USB, Ethernet, MS-CAN while using MODBUS protocol
- AC hardwire terminal options on selected models
- Fanless convection cooling with extruded aluminum heat sinking, for maximum efficiency and reliability



Wireless Android and iOS utility apps included for easy set-up and monitoring with remote devices

MORNINGSTAR
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As seen in:

SOLAR
BUILDER

Solar
Power World

pV magazine

I P E S



Introducing GenStar MPPT: the industry's first fully-integrated Solar DC system controller

Out of the box, GenStar is an overachiever—delivering legendary Morningstar quality, efficiency, power and reliability along with our latest in advanced communications and control technologies. But the GenStar genius doesn't stop there

We asked leading solar professionals for their "wish list" of advanced technologies and capabilities. Then made it easy and cost-effective to add them when needed, through our innovative ReadyRail architecture

The expandable GenStar is fully future-proofed for system needs, today and tomorrow. With three models up to 100A maximum current, GenStar's ready to bring success to your next critical project

- All-new design with "lithium DNA" and advanced communications/control features
- Oversized PV array input capability along with powerful 30 Amp load control—unique for a controller in this power class
- Full network integration without adapters, wiring or extra equipment needed
- Fanless design for maximum efficiency and reliability

READY|BLOCK

Advanced features can be built-in and fully integrated with exclusive snap-in ReadyBlocks, instead of wired outside the system as accessories:

- ReadyShunt— battery metering/monitoring, key metrics including SOC, energy in/out (Amp hours), current measurement for system sources and loads, and more
- ReadyBMS— full communications and control with lithium batteries
- ReadyRelay— signaling (dry contact), advanced load control

MORNINGSTAR
INTEGRATEDSERIES
WORLD'S LEADING SOLAR CONTROLLERS & INVERTERS

8 Pheasant Run, Newtown,
PA 18940 USA
www.morningstarcorp.com



TRAKSTAR
MAXIMUM POWER POINT TRACKING



With optional ReadyBlocks Installed



NEWS Products



Bill Mellema: We saw integrators, installers and system designers looking for more capable and feature rich solar controllers by looking at what they currently were using: a patch-work of accessories and modules cabling and dongles to get existing controllers where they need them. And we thought "if anyone can come up with a fully integrated DC charging system eliminating all of that, Morningstar can." GenStar is the result— the industry's first fully-integrated solar DC charging system.

We started with an all new design incorporating "lithium DNA," acknowledging the future of energy storage and in keeping with the goal of delivering a truly "future-proofed" product. All the most requested key communication and control features are built-in. Essentially, GenStar combines the power and stability of our iconic TriStar family of charge controllers with our most forward-thinking research and development— everything we've learned over three decades.

Along with the most requested features we gave GenStar the capability of being easily upgraded and expanded with new features and technologies, through our revolutionary ReadyRail architecture and ReadyBlock expansion line. ReadyBlocks simply snap-into the GenStar's ReadyRail to deliver any additional features and capabilities needed: metering and monitoring, signaling and advanced load control, and full communications with lithium batteries. With GenStar and its designed-in flexibility and adaptability, system designers need never worry about obsolescence or making the wrong decision in the initial investment. GenStar can grow with a system and network architecture as their needs evolve.



2006



SureSine™ Classic Inverter:
compact and rugged, designed for the demanding conditions of rural electrification and now a favorite for cabins, RVs and marine, telecommunications, security and other applications

SunKeeper™ Controller:
a HazLoc-rated Junction Box Mounted solar charge controller for small, single module systems in tough environments

2007



SunSaver Duo™ Controller:
a two-battery solar charge controller with optional remote meter, designed for RV/caravan and marine use, based on the proven SunSaver platform

Leadership Team



Ivan Jadric, Director of Engineering

Joining Morningstar's Engineering team two years ago has allowed me to become a part of an outstanding group of people who know how to design the best electronics for off-grid solar while also having fun in the process. Morningstar's strive for excellence rooted in the commitment to our employees and customers, and in a common sense of ownership, is different from the other employers I have known, and truly inspiring.



Bill Mellema, Director of Product Management

Morningstar has provided the room for growth and learning that has kept me engaged and excited throughout my career here. We have a high-impact mission and I know the products we develop, sell, and support make a difference all over the world. Our entrepreneurial culture means each of us has an outsized opportunity to affect the direction of our small company. As owners of the business ourselves, there's a level of commitment and camaraderie that you don't typically see in other organizations.



Brad Berwald, Product Manager

Morningstar is a fantastic workplace. You cannot ask for much more when you already work in a great environment, with friendly and smart co-workers, making a big impact on the world while having fun doing it. I've been lucky to spend most of my career at Morningstar and look forward to even greater things in the future.



Jim McGrath, Director of Sales

Morningstar means innovation, sustainability, and empowerment to me. As a leading provider of solar charge controllers and inverters, we enable people to access reliable, clean energy that improves their lives and the environment. Our commitment to innovation and sustainability drives us to improve our products and operations continually. At the same time, our focus on empowering customers and communities inspires us to create a positive social impact.



Qing Kou, Director of Manufacturing & Supply Chain Management

As we celebrate Morningstar's 30th anniversary, I am grateful to everyone who participated in this journey. Working with such an amazing group of people who share our commitment to innovating and promoting renewable energy worldwide has been an honor. Together, our vision for a better world is more attainable than ever.



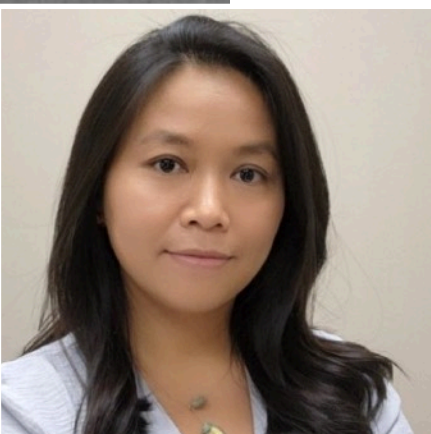
Mark Cerasuolo, Director of Marketing

I worked in the solar industry for the better part of a decade before coming to Morningstar. From the outside, Morningstar had always seemed like the "brand that did everything right." Based on decades of previous experience in other places I expected to be let down a bit once I joined Morningstar. But it's been five years now and that's yet to happen—Morningstar really is that shining brand I admired from the outside!



Kathy Yost, Human Resources Manager

Morningstar provides me with the opportunity to nurture a positive, healthy working environment for a technology organization with a challenging, compassionate mission in solar renewable energy. The employees at Morningstar are responsible for developing and supporting our products around the globe and I am driven to ensure that Morningstar is a place where we can thrive and reach our full potential. At Morningstar, every employee has a voice and a purpose, and we've developed a culture that supports the uniqueness and authenticity of each individual. We focus on quality at Morningstar in all that we do and it makes Morningstar a very desirable place to be!



Keam Seng, Operations Manager

Joining Morningstar was one the best decisions in my career path, after switching from 10 years in the healthcare medical device industry. Every day here I learn new things about how our products impact the world—in extreme environments, corrosion, lightning surges and harsh ambient operating temperatures. Morningstar provides me with the opportunity to become a part of an amazing team. I have experienced the "customer first" approach as a key success at Morningstar, and I am looking forward to many greater years here.

Project Profiles

2008



SunSaver™ MPPT Controller: an industrial-grade design proven in challenging applications. Ideal for off-grid systems up to 520W and the first to incorporate TrakStar MPPT technology



Morningstar introduces **TrakStar™** an advance in Maximum Power Point Tracking (MPPT) algorithm technology, delivering the industry's best-in-class peak solar array efficiency rating

2009



TriStar™ MPPT Controller: designed to deliver MPPT solar harvesting efficiency along with proven TriStar reliability. For larger off-grid PV energy systems up to 4.2 kW. Highest peak efficiency for off-grid controllers in the industry, up to 99%

Five years ago we reported on key off-grid rural electrification projects around the globe, including Tozzi Green in Peru. Morningstar has been busy building out our portfolio since then, also focusing on industrial projects with special emphasis on oil and gas, security and telecommunications applications among others.

Backed by our reputation for dependability under extreme conditions in demanding applications— and enhanced by our coveted hazardous location certifications (HazLoc)— Morningstar products are standard equipment now in installations ranging from the North Sea to the Sahara Desert. A few of the most noteworthy ones:

1. Enabling Monitoring and Control in Remote Oil Fields

Product: SunKeeper™ controllers
Partners include: SunWize

Solar power has a significant role in the oil and gas industry, largely due to the remote locations of most drilling operations. The variety of energy needs involved in oil and mining, including supervisory control and data acquisition (SCADA) and telemetry, make solar energy a cost-effective way to provide power to production sites. SunWize uses Morningstar's SunKeeper controllers for use in RTUs (Remote Terminal Units) for many of its sites for two reasons: first, they can withstand the harsh environments of many drilling locations. And second, they carry the UL



Hazardous Location operation certification so critical to oil & gas producers.

"We chose Morningstar charge controllers to regulate battery charging at off-grid oil and gas sites because **they maximize battery life and they can withstand the harsh environments** that are commonly associated with remote pipeline and drilling locations"

—SunWize Power & Battery, LLC, a leading supplier of quality powering systems for remote sites



2. Solar Powered Helideck Lighting

Location: Brunei, Southeast Asia

Product: TriStar

Partners include: Orga BV, Shell

Jack-up platforms often serve as offshore hotels and heliports for workers and visitors commuting by helicopter to and from oil and gas wellhead platforms. Aviation safety status lights are critical to operations, providing visual warnings to alert pilots whether a helideck is safe for landing. Often these critical warning lights require their own reliable, rugged solar power system with high power availability, autonomous operation, and simple routine maintenance. Orga BV provides dependable, effective status lighting systems powered by solar to meet the tough demands of these applications. They chose Morningstar controllers because

they are 'fit and forget,' reducing expensive service calls as well as their suitability for use in a potentially explosive environment

"...We standardized on Morningstar MPPT solar controllers... for use in safety-critical power systems for offshore oil and gas assets... with Morningstar, we know we won't have to go back for expensive service calls in the field."

—Remco Vonk, General Manager Asia & Pacific, Orga BV, a global provider of offshore power systems for safety-critical infrastructure assets



2011



SunSaver™ (GEN 3) Controller: rated for HazLoc applications, the third generation brings over two decades of advances in software & electronics to the same rugged design that made the original the leading solar powering solution for oil & gas, mining and other extreme industrial applications

2012



SHS Night Light™ Controller: adds automatic lighting control to the SHS (Solar Home Systems) series. Designed for markets outside the USA and Canada and meeting the necessary World Bank specifications, SHS provides features and benefits specific for residential applications

2013



TriStar™ MPPT 600V Controller: an innovation in high-powered fanless controller design that accepts PV array input up to 600 Voc, enabling installers to design systems with longer and fewer strings

Ground Fault Protection Device (GFPD): prevents current from following any unintended paths during a ground fault

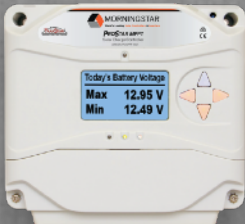
2014



TriStar™ MPPT 30 Amp Controller:

a new model in the successful TriStar MPPT series, which has become the industry's-leading charge controller and first choice for critical higher-powered applications

2015



ProStar MPPT™ Controller:

building on the ProStar legacy, the MPPT version is released, an advanced battery charger for off-grid PV systems with PV array max power (Pmp) up to 1400 watts



Patent awarded for a modulation control scheme for a dual active bridge (DAB) DC to DC in a charge controller. Synchronization software for the TriStar MPPT 600V controller is also introduced



3. Creating a Sustainable Marine Experience in Greyhope Bay

Location: Aberdeen, Scotland

Product: TriStar TS-MPPT-60 controller

Partners include: JCE Energy

Torry Battery, a landmark artillery installation that has overlooked Aberdeen's Greyhope Bay harbor since 1860, is known today for its spectacular panoramic views of the city and coast as well as the largest bottlenose dolphins in the world. Conservationists renovating the Battery into a modern educational marine center selected JCE Energy to create a renewable power solution to achieve a zero-footprint, sustainable design. For the project, JCE chose Morningstar TriStars to use in a unique solar powering system with arrays mounted on shipping containers.



4. Tier-one Telecom Company's Remote Integrated Arctic Solar Solution

Locations: remote Arctic site deployments

Product: TriStar MPPT 600V charge controller

Partners include: Apeiron Energy, Polarium Battery

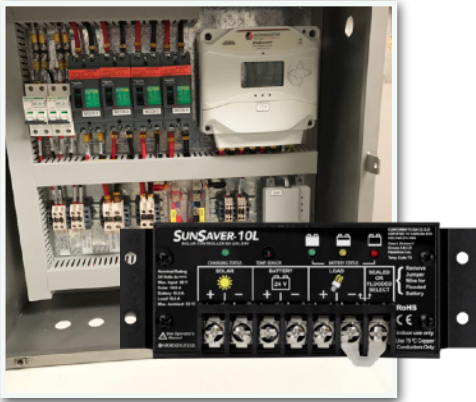
ARIAS (Apeiron Remote Integrated Arctic Solar) Solution provides operators of telecom/wireless, mining and remote community communications systems with "complete off-grid critical communications functionality" in the most extreme operating conditions, one that can reduce a client's annual fuel costs 90% and help them achieve ESG (Environmental, Social & Governance) goals. In this ARIAS configuration provided for their telecom client, Apeiron installed a bank of Morningstar TriStar MPPT 600V solar controllers chosen for their ultra-high reliability in remote,



difficult to access installations. TriStars also enable simpler, leaner system design and installation through fewer module strings and less wiring.

"Morningstar's seamless compatibility with industry-leading component suppliers, such as Polarium, is why Morningstar is our preferred vendor of choice."

—Kurt Chelsberg, Apeiron Energy's Vice President, North America Energy Group



5. Solar Power Systems Provide Crucial Services in Remote Kuwait Oil Fields

Location: Kuwait

Products: TriStar TS-MPPT-60 controllers, TriStar-45 controllers (load control) and EIA-485 / RS-232 Adapter (RSC-1)

Partners include: EcoSol Energy Systems

Kuwait is a dry and arid country with extreme temperature shifts from desert summers to frigid winters. Kuwait's economy is heavily dependent on fossil fuels; the government-owned Kuwait Petroleum Corporation oversees the production of crude oil. With most oil and gas sites in remote areas with restricted access, Kuwait Oil requires backup battery solutions with high performance, total reliability and low maintenance to power essential equipment and systems. Their supplier EcoSol Energy Systems turned to Morningstar to keep critical oilfield lighting and communications systems running without interruption using TriStar TS-MPPT-60 controllers. This power system is fully reliable in extreme temperatures, can withstand rugged wear-and-tear, and supplies off-site communications to keep systems running.



6. Off-Grid Power at South Texas Oil and Gas Sites

Location: South Texas

Products: TriStar MPPT and SunSaver controllers

Partners include: Ameresco Solar, Deka Solar

An off-grid application at the Eagle Ford Shale site in South Texas uses TriStar MPPT solar charge controllers to regulate battery charging to power supervisory control and data acquisition (SCADA) equipment, RTUs, and cathodic protection. One of the world's largest oil and gas companies

chose Morningstar products because of their reputation for reliability and strong customer support.

"Morningstar's wide product portfolio lets us choose the right solar charge controller for small SCADA, RTU's, process automation, cathodic protection, and many other off-grid loads at upstream and midstream oil and gas sites."

—Ameresco Solar, a design, engineering, and solar integration company specializing in custom off-grid industrial systems

2016



IEC 62109 certification for all MPPT Controllers and the TriStar PWM

Ethernet MeterBus Converter (EMC): IP-based connectivity device which provides data and communications for select Morningstar products— between themselves, with surrounding systems, and with the outside via the Internet

Gen 3 ProStar Controller: adds data and lighting control capabilities, a graphical interface, and advanced protection features that meet the needs of today's most demanding off-grid solar applications

2017



EcoPulse™ Controller: a new price point for PWM pulse width modulation (PWM) solar charge controller with Morningstar's Essential Series™ of products, providing essential off-grid battery regulation functions



Morningstar and Tozzi Green jointly develop the **DC Energy Box**, the key component in solar systems which will ultimately bring electricity to over a quarter of a million Peruvians. This is the world's largest off-grid rural electrification project to date

2018



Over four million
Morningstar products sold

EcoBoost™ MPPT Controller:
along with EcoPulse, the EcoBoost
forms the new Essential Series to
bring Morningstar technology and
quality to a wider audience

2019



Morningstar launches the **Energy Storage Partner (ESP)** program which makes it easier for system installers to specify and integrate lithium and other advanced battery technologies into a system. The program will grow to include over 20 battery manufacturing partners, including some of the leading brands in that category

2020



Ethernet MeterBus Converter EMC-1:
The EMC-1 is now SNMP-Enabled to
allow system operators to access
full network monitoring



7. A Hybrid, Cost-Effective Oil & Gas Platform Powering System for the North Sea

Location: Danish sector of the North Sea

Products: TriStar TS-MPPT-60

and TS-MPPT-45 controllers

Partners include: JCE Energy

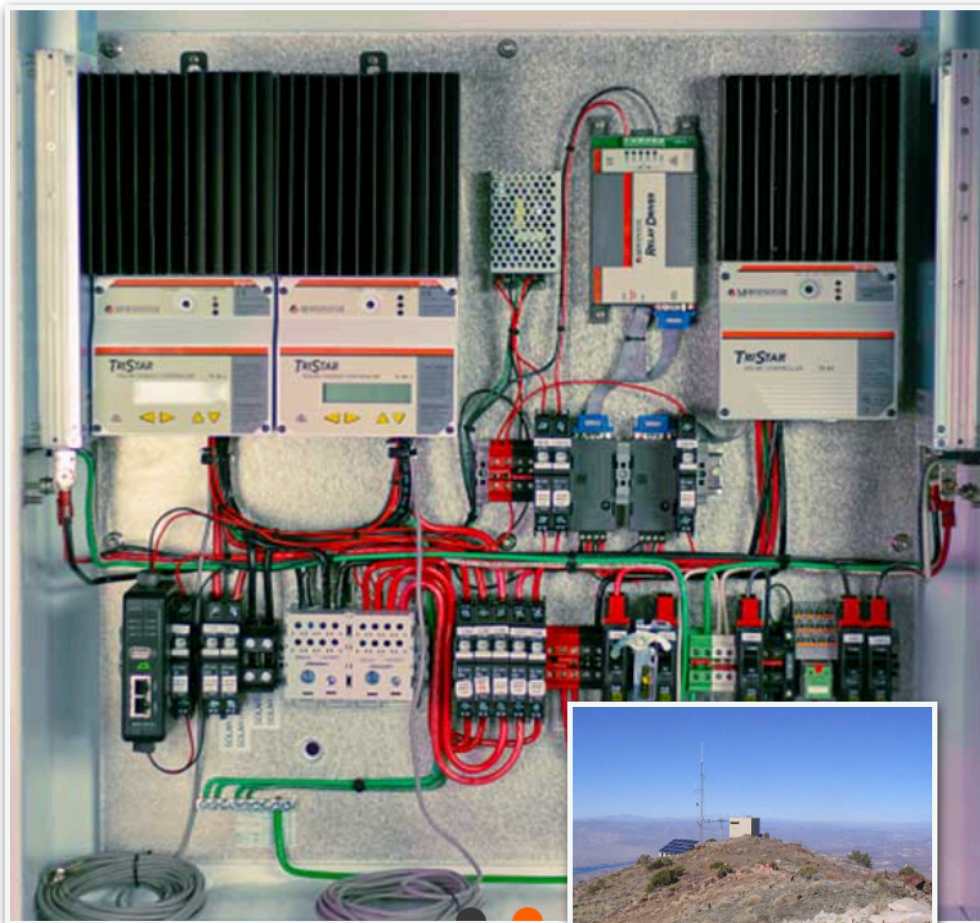
JCE Energy's client sought a cost-effective system to supply power to telecommunications systems, navigation aid systems, bird deterrent systems, foghorns and other applications on its unmanned platform in the Danish North Sea. Operating on an unmanned platform in a remote location at sea, the system had to be fully operational without any human supervision, and sufficiently weatherized to withstand the harsh conditions of the North Sea. To



accomplish this JCE engineered a Zone 1 HazLoc hybrid power system using Morningstar controllers—one that is fully autonomous, requiring minimal maintenance and generating significant cost savings.

"Morningstar's high quality, reliable controllers make them [our] No. 1 partner when supplying power to many of the world's most remote, harshest environments."

—Lukas Geider, JCE Group, provider of "Ex" electrical control systems for hazardous and safe area environments



8. Solar-Powered Portability for Trouble-Free Mobile Surveillance

Location: mobile units that can be deployed anywhere needed

Products: ProStar MPPT, EMC-1 Ethernet MeterBus Converter

Partners: ECAMSECURE, a GardaWorld Company

Founded three decades ago, ECAMSECURE embraced emerging new technologies to transform from a traditional security guard service—with all the human limitations inherent in that model—into a pioneer in “virtual guard” and mobile self-powered video surveillance platforms that can operate 24/7 in the most challenging environments. Their Mobile Surveillance Units (MSUs) and other products serve clients in law enforcement, commercial and corporate users, construction facilities, utilities, government agencies and more. These portable, off-grid

units have the form-factor of a small trailer and accommodate a variety of security hardware, including video cameras and lighting. Selected versions use solar modules and have lithium-ion batteries on board for energy storage with Morningstar ProStar MPPT charge controllers. Along with their ideal solar harvesting and cold weather qualities, ProStars can communicate with ECAMSECURE's Certified Command Center via Morningstar's EMC-1 networking device, making them ideal for remote surveillance operations.

“They [Morningstars] are truly built to endure in the toughest environments... With predictive analysis enabled by data from Morningstar controllers, we can monitor system health and achieve our client ask for 24/7 surveillance.”

—Lemuel Blanco, President and CTO of ECAMSECURE

2021



Morningstar achieves HazLoc certification on ProStar MPPT, ProStar and SunSaver MPPT solar charge controllers—both UL/CSA for North America and IECEx/ ATEX for International and European use

With the industry's broadest line of HazLoc controllers, including MPPT types, solar professionals can specify larger systems for critically powering remote oil & gas and other operations



2022

SureSine



Morningstar launches a complete **SureSine inverter** line for off-grid industrial and other applications. Built to the same standards as Morningstar controllers and based on long-time installer demand for a “Morningstar of inverters,” these new models cover systems from 150 to 2500 Watts, with full communications capabilities and seamless integration with Morningstar controllers

2022



MORNINGSTAR
INTEGRATED SERIES



GenStar MPPT: an industry first, a fully-integrated solar DC system controller with all communications and control features built-in. GenStar is also first in a new Integrated Series for Morningstar, one completely future-proofed for evolving system needs through an innovative ReadyRail feature. Snap-in ReadyBlocks can easily be added when needed, for lithium battery integration, metering and monitoring, and advanced load control



9. Solar Skids Remotely Power Sensors in the Chilean Desert

Location: Antofagasta, Chile

Products: SunSaver SS-MPPT-15L controllers

Partners include: Connexa, RELiON

Antofagasta lies between the Pacific coast and Northern Chile's Atacama Desert. Corrosive salt in the air and harsh desert extremes combined with dangerous gasses and liquids potentially present in industrial applications create a demanding environment for power electronics. Connexa, an integrator company specializing in remote solar-powered skids for remote powering applications, had a client looking to remotely power sensor systems to monitor liquids in this challenging setting. Logistics posed yet another concern: any solution had to fit in a small pickup truck and be manageable with a two-person installation.

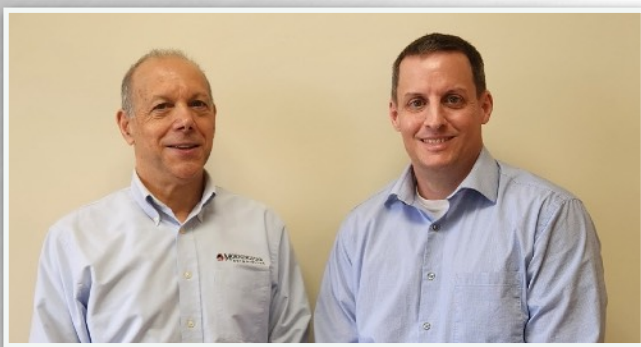
To meet the challenge, Connexa's team designed and built over 50 container-loaded skid systems, each with a solar

module, a RELiON lithium battery, a Morningstar SunSaver SS-MPPT-15L charge controller, and a stainless steel enclosure. Connexa specified SunSaver controllers because they're approved for use in hazardous locations, and was also influenced by RELiON's participation in Morningstar's Energy Storage Partner Program, which ensured a reliable, more seamless solution.

"We love Morningstar and generally use it in most applications. It's very rugged, sturdy equipment rated for use among dangerous liquids and gasses, which is ideal because many of our projects aren't in the kindest environments. Equally important, we're putting our name on our projects and accepting responsibility for the entire system. It's important for us to have tested, proven, reliable components..."

—Justin Taylor, Sales Manager,
Connexa, provider of remote security
and surveillance systems

Looking Forward:



Our Leadership Tradition Continues

Along with celebrating 30 years of solar product leadership, Morningstar is looking forward to its next decade with its founding values, ethics and principles firmly in place as Bill Mellema becomes its next CEO, taking over from the retiring Lee Gordon.

Bill's management skill and style, proven over his 22 years of experience at Morningstar (which included directing our Engineering and Product Management teams), were instrumental in the unanimous vote of confidence by Morningstar's Board of Directors electing him into this role. Their decision was also informed by the overwhelmingly positive employee feedback they received regarding Bill, during a thorough executive search process.

With Bill's selection, Morningstar is assured of both continuity in leadership as well as a clear path into new, exciting markets and categories along with progress and growth in our legacy areas. To assist in that, Lee Gordon will continue as Chairman of the Board. The entire Morningstar team wishes Lee the best and Bill success as we move forward into our fourth decade!

Morningstar customers speak

"...you get what you pay for, and this one is worth every penny ... count on Morningstar"

I've probably used every model that Morningstar makes at one point or another... In a high-altitude, low temperature environment with reflective snow cover, the MPPT works incredibly well, providing about 20% to 25% more energy capture...I've measured it side by side...it's astonishing."

—Tracy Dahl, polar power expert using Morningstar in Arctic and Antarctic projects

"We have chosen Morningstar products for our off-grid solar photovoltaic solutions deployed at about 2,000 sites in the Middle East... [they have] proved to be a reliable source of power supply even in the harsh desert conditions."

—Agile Europe, provider of system solutions for oil & gas projects throughout the Middle East

"The Morningstar TriStar 45A & 60A Controllers are the best controllers in the world for diversion load applications..."

—Europe/Florin Fleseriu, EcoVolt

"Morningstar has a strong track record for producing high quality charge controllers and TRAKSTAR MPPT technology is superior to other MPPT technologies. We immediately experienced an increase in power..."

—Australia/Leigh Horton, Key Manager System Design, West Coast Solar and Wind

"We have used Morningstar charge controllers since 1997, and the performance and support for these products has always been excellent"

—Central America/Victor Hugo Munoz, Synthesis Power



THE OFF-GRID SOLAR EXPERTS

Morningstar customers speak (cont.)

"Having distributed solar products in Africa for years, I know which manufacturers tend to last and which ones fail. Morningstar being very much in the "lasting" category."

–Lincoln Dahl, African Energy (distributor)

"While there are many MPPT products on the market, Morningstar's robust collection of online resources helps simplify sizing and allows us to more easily perform site and cost software analysis. Not only is this a benefit for our customers, it's also helpful for our younger engineers who want to learn. This, and the efficiency that Morningstar controllers offer in small, hot spaces on our unmanned applications, makes them our first choice."

–BC Tan, Group CEO, Swift Energy, provider of oil & gas offshore power solutions



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