



# Sustainability

*Sustainable practices for a healthy environment.*

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## The Morning Star sustainability report.

This report features the latest information on the sustainability advances and environmental endeavors implemented within the Morning Star enterprise. Morning Star is pleased to remain at the forefront of tomato processing technology and agricultural sustainability and we are constantly working to improve our processes, better the environment and guarantee a safe, wholesome product for our customers and consumers.

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### Snapshot Summary



Average drip irrigation use of our growers increased by 5%.



Efficiencies achieved through combined cycle natural gas power generation have helped curb our overall greenhouse gas production.



Process water efficiency dropped due to the excessively long season and lowered factory speed at Liberty.



Our factories are designed to leverage efficiency through large scales of production, although water, gas and electricity usage in the factories are not fully variable with production. Changes to season length and production volume in raw tons from the field will drive the efficiency of resource utilization and economy. Annual production may vary to right-size inventory levels or respond to natural events that cause impacts to the quantity and timing of fruit harvested and processed. We are positive as we look towards future crop years that we will indeed be able to leverage the full economy of scale of our operations as our internal strategies are aligned to achieve maximum production and consume minimal natural resources.



# An innovation focused company founded on principles of honesty and integrity.

With facilities in both the San Joaquin and the Sacramento Valley, The Morning Star Packing Company is ideally placed to acquire and process tomatoes in California's fertile Central Valley. Over the past 50 years of operation, Morning Star has transformed itself from a one truck owner-operator business to processing over one quarter of the California tomatoes grown for processing.

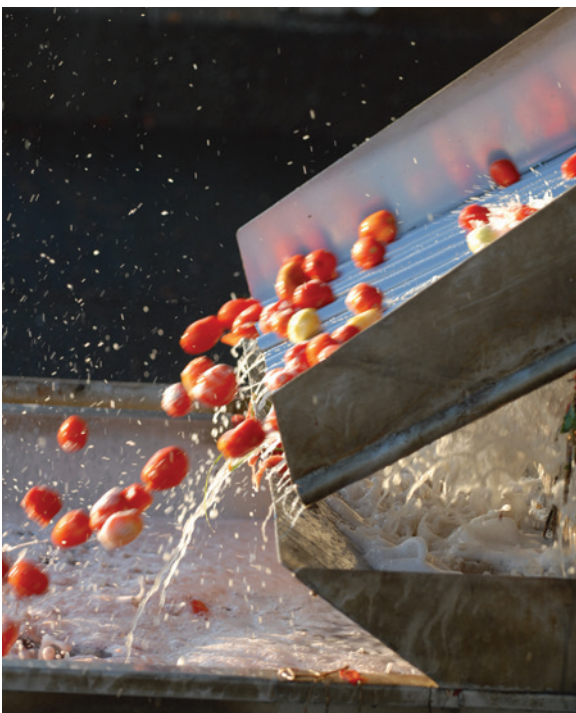
The Morning Star Packing Company now owns and operates three tomato processing facilities: two near Los Banos (in the San Joaquin Valley) and the other in Williams (in the Sacramento Valley). The Morning Star Packing Company has been built on innovation and continuous improvement from its inception. With advances such as a gravity-fed flume unloading system and replacing the traditional cooling tower with a cooling pond, The Morning Star Packing Company is staying on the forefront of food processing technology through harnessing nature's attributes. These, and numerous other innovations, allow The Morning Star Packing Company to process more tomatoes in less time using fewer resources.

## Our Vision

To be an Olympic Gold Medal performer in the tomato products industry. To develop and implement superior systems of organizing individuals' talents and efforts to achieve demonstrably superior productivity and personal happiness. To develop and implement superior technology and production systems that significantly and demonstrably increase the effective use of resources that match customers' requirements. To provide opportunity for more harmonious and prosperous lives, brining happiness to ourselves and to the people we serve.

## Our Mission

Our Mission is to produce tomato products and services which consistently achieve the quality and service expectations of our customers in a cost effective, environmentally responsible manner.



## Our Sustainability Statement

In our Mission, "environment" is not limited to nature nor to the recent "sustainability" paradigm. To us, it includes customers, neighbors, colleagues, competitors and suppliers. Acting in an environmentally responsible manner means we conduct ourselves in a manner which all areas of our full environment, both business and nature, would respect. This is Sustainability for us, and it has been in our Mission Statement for over 30 years.

Our goal is to ensure a healthy environment. In partnership with our suppliers, we use economically viable practices to protect scarce resources; improve air, water, and soil quality; protect wildlife resources; and conserve non-renewable mineral resources. We reduce waste and pollution through technological innovation, conserve energy, and economize our use of water, pesticides and nutrients to those biologically required for a successful crop.

### **Leveraging Gravity**

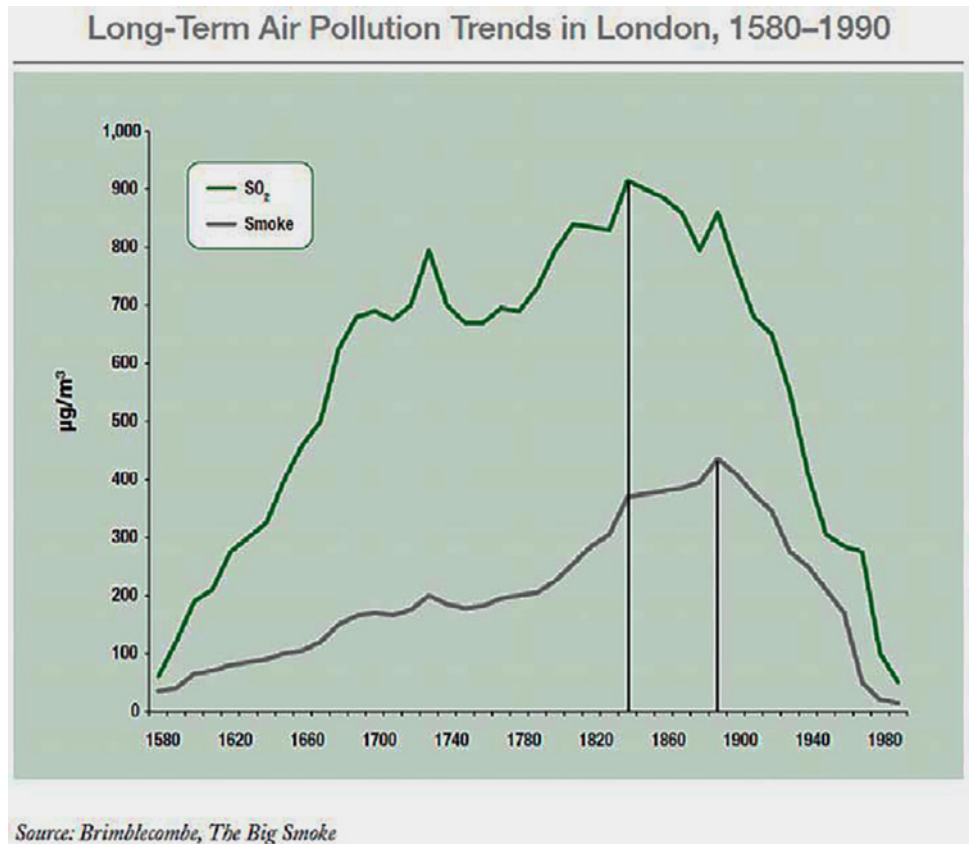
*Gravity-fed unloading hill and flume systems use minimal to no electricity and decrease breakdowns.*

## A short history of the sustainability movement.

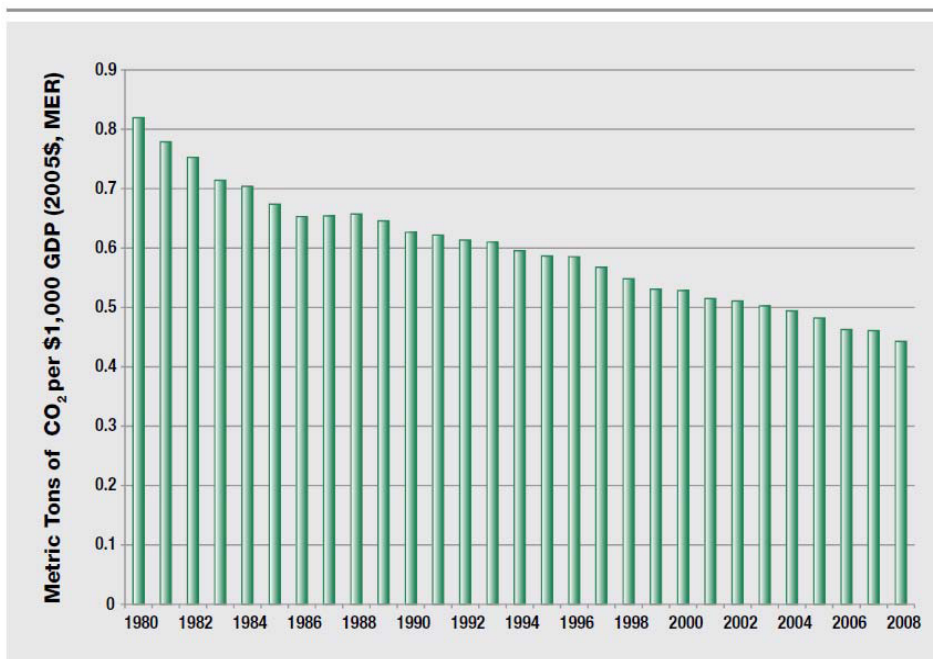
Environmental sustainability has historically been a subconscious element of economic sustainability. Even if an industrial process did not produce any greenhouse gasses, it was not implemented if desired product output was not achieved. Despite this, in recent years people have started to pay more explicit attention to the longer-term aspects of the use of the environment and resources and how it continuously changes over time.

Contrary to widespread belief, the past centuries have shown that the environment of the industrialized world has been steadily improving as measured on a wide variety of scales. The graph at right shows how long-term air pollution trends have been quite encouraging, at least in the past 150 years or so. One significant reason for the emissions reductions is simply the fact that emissions are almost always a byproduct, and as industrial processes get more efficient, they naturally produce fewer byproducts. In this way the never-ending industrial tendency of becoming more resource efficient almost always results in becoming more environmentally sustainable.

Two other factors that serve to determine the effect that we have on the environment are wealth and rule of



### U.S. Greenhouse Gas Emissions Intensity, 1980–2008



Source: EIA

law. In general, the wealthier a nation is, the less likely it is to be heavily polluted. Similarly, the better the rule of law relative to private property is enforced impartially, the more people take care of things (including the environment) that belong to them. If someone owns something that produces value over time, they will help it to continue to produce value over time. The graph at left demonstrates how the U.S. has continually improved in efficiency as measured by carbon dioxide emissions per \$1000 of GDP over the past three decades.

## It all starts in the fields.

The Morning Star Packing Company has been involved in sustainable and environmentally responsible agriculture for over 30 years. Every season we collect and monitor field data from each grower in order to track trends and patterns. We are active in Ag R&D through our enterprise affiliates Lucero Farms and California Sun Grower Services.

### Sustainable Agriculture Program

All grower-suppliers to the Morning Star enterprise must follow our Sustainable Agriculture Program. The program's objective is to ensure the largest crop is produced while using the least possible resources, all while being diligent about cause minimal damage to the environment we all share.

Regulations by both USEPA, CDPR and CDFA ensure efficient use of all fertilizers and pesticides in the growing of tomato crops while helping to maintain biodiversity in the area. All grower-suppliers must follow and maintain these four criteria: 1) retain appropriate documentation on site for all applied fertilizers and pesticides; 2) use only USEPA registered materials allowed by the California Department of Pesticide Regulation and comply with additional restrictions set forth by the California League of Food Producers and Morning Star; 3) ensure that no crops are grown with industrial or municipal bio solid waste; and 4) certify that only non-genetically modified varieties are grown and harvested.

The Morning Star Packing Company strongly encourages each grower to follow additional guidelines, such as avoiding production in ecologically sensitive areas, limiting erosion of nearby land, utilization of integrated pest management systems which can include a variety of tools that use natural or biological products such as BT's, cultural practices that include cover cropping, crop rotation, mechanical removal of weeds or diseases and judicious use of chemical controls.

### We harvest and truck our own tomatoes.

Morning Star harvests the tomatoes from the grower-suppliers' fields using special harvesters that have been fitted with extremely efficient engines to reduce both operating cost and environmental impact. In addition, our harvest tractors are consistently updated to ensure we meet the air quality restrictions of the California EPA. The Morning Star Trucking Company coordinates with the harvest to haul the tomatoes from the field to the factory to ensure maximum efficiency in trips and timing, which minimizes cost and emissions. See pg. 10 for details.

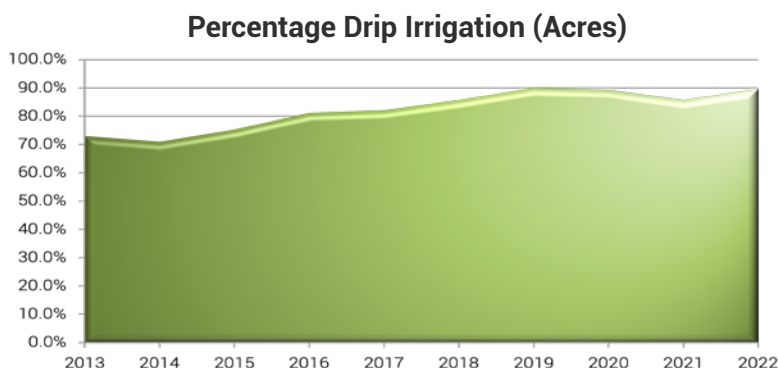
### Regenerative Agriculture

The Morning Star enterprise is actively researching regenerative ag within the agricultural industry. This concept has been around since pre-modern times but has gained momentum over the last decade by groups looking to further define and implement its techniques. It is an entire systems approach that focuses on soil health. Sustainable agricultural practices are a part of the long term regenerative ag practice.

"Regenerative agriculture is a conservation and rehabilitation approach to food and farming systems...It's not a specific practice itself. Rather, proponents of regenerative agriculture utilize a variety of other sustainable agriculture techniques in combination." *Source, Wikipedia*

### Drip irrigation has become the standard.

Morning Star encourages its growers to invest in drip irrigation systems, which are the most efficient way to irrigate. Water is applied by precise application which allows for better utilization of our precious resource.



Morning Star has been actively developing new partnerships with growers over the last few years due to the increased demand in tomato products. These new growers are in the process of converting existing furrow irrigated acreage to drip irrigated row crops, such as processing tomatoes. Morning Star understands the difficulty and importance of converting to drip irrigation, so we work in collaboration with our new growers to support and assist them in this conversion.

## Maximizing resources to minimize energy consumption.

The facilities within the Morning Star Enterprise are specifically designed to minimize electrical power consumption. One of the primary ways that this is done is through the installation of cooling ponds for the water used by the evaporators. This water is pumped from the cooling pond to the top of the evaporators where it flows out the bottom of the evaporators and back to the cooling pond. This process only involves one pumping of the water, whereas a conventional cooling tower approach requires that the water gets pumped twice (from the bottom of the evaporators to the top of the cooling tower and the bottom of the cooling tower to the top of the evaporators). Considering the massive volume of water that goes through the system, the fact that the water is only pumped once results in saving approximately 2.2 million kilowatt hours per year, per factory.

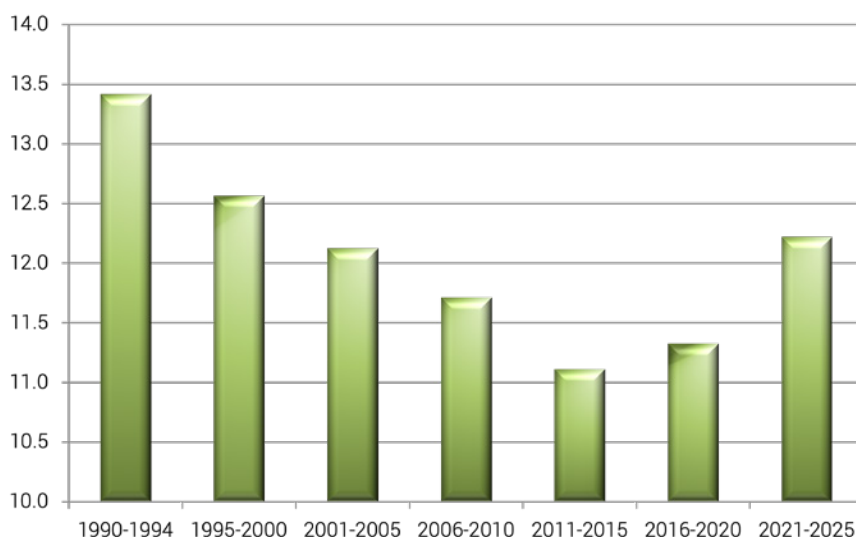
Another way we conserve both electricity and water is by using variable frequency devices (VFDs) to control our pumps. A VFD automatically responds to the liquid demand of the plant, slowing the pump if not much liquid is being used and speeding it up if more liquid is needed. This technology vastly improves upon the older method which pumped the same amount of water all the time even when the supply was greater than the demand. The excess water was diverted to a ditch, wasting both the water and the electricity used to pump it. By installing a VFD on a well, we managed to avoid consuming 160,000 kilowatt hours of electricity annually on that well alone.

In addition to the major savings from the cooling ponds and other efficient industrial processes, there are many smaller electricity savings through the use of steam driven turbines vs. electric motors, energy efficient lighting applications throughout the factories and more energy efficient information systems that precisely control plant functions.

## Natural gas efficiency.

Natural gas is primarily used to heat water to produce steam which is then used for a variety of purposes, ranging from heating product to turning turbines. In addition, we have two cogeneration units that combust natural gas to power a large electrical generator, with the combusted waste heat used to make steam for production. This combined cycle process makes for much more efficient gas usage than importing electricity from the grid and combusting gas alone in a boiler. In addition, we establish a "micro-grid" which is fully self-contained within the factory premises, reducing the burden and demand on the larger electrical grid operation and maintenance.

**Natural Gas Therms per Ton - Five Year Averages**



Source: Morning Star



## Re using heat.

Many parts of our production process involve the application of heat, either directly via heaters or through a medium such as steam. As with other resources, we recapture and reuse this heat, using heat exchangers installed in the evaporators. The evaporators feature three vessels with common vapor lines. Heat is applied in the first vessel and is drawn into the second and third vessels using steam ejectors and water condensation. These heat exchangers transfer the steam's energy to the tomato juice flowing through them by recycling vapor under differing pressures, thus allowing varying boiling points to be achieved.



## Every drop of water counts.

Water is an essential part of any food processing facility. The Morning Star Packing Company uses water to produce steam, to move tomatoes through the flumes and to clean equipment.

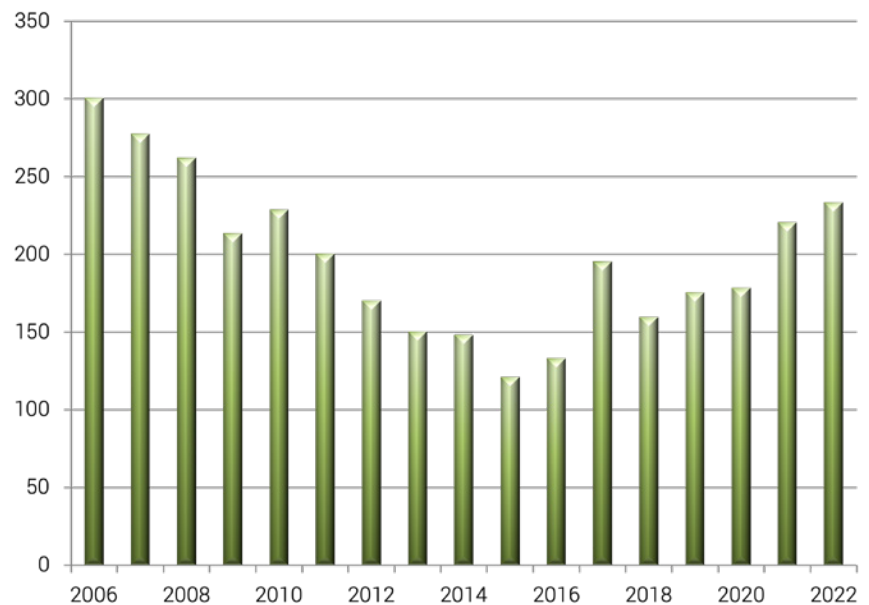
Like any other resource, we do our best to reuse the water which we consume. In each facility we have two to three different loops of water used for tomato delivery into the plant. In each section, the water serves to both move the tomatoes through the plant and to clean them. Each section's water system recirculates, meaning that the water is reused over and over. We introduce only enough new water to maintain a clean flume system.

The evaporators use another recirculating loop inside the steam generation system. When the boilers produce steam from water, the steam goes through the evaporator heaters, returns to the boilers and is reheated, instead of being vented into the air. This system uses far less energy than boiling cool well water every time.

We have also determined that we can use cooling pond water in the ejector systems of our evaporators, which saves approximately 400 gallons per minute of well water per facility, resulting in a water savings of over 47.5 million gallons of water every year.

The processing water that has reached the end of its useful life is used to irrigate cover crops on Morning Star owned fields surrounding the factories. This irrigation method recycles the water back to the environment and allows for commercial crops to grow and generate value.

**Process Water Gallons per Ton**



Source: Morning Star



## Making more from less through resource recovery.

The Morning Star Packing Company strives to recover as many usable resources as possible from the various plant byproducts. We do this through several different practices, which help us reduce our environmental footprint.



Tomato Pomace

### Tomato pomace recovery.

Many Morning Star tomato paste products do not include tomato seeds and only small amounts of peel. During the Finishing Process (where seeds and peel are separated from the tomato juice) a co-product is produced called tomato pomace. We collect this nutrient-dense mixture of peel and seeds and utilize it in a multitude of ways, including soil amendments, animal feed and a dehydrated powder for pet food. This ensures 100% of the tomato serves a useful and environmentally friendly purpose.

### Thinking about the future.

Morning Star produces our own dehydrated tomato powder from our factories tomato pomace. We capture and reprocess this co-product, which serves as an important role in responsible upcycling. Dehydrated tomato powder is a nutritive component of pet food and can also be used in the cosmetics industry.



Dehydrated Tomato Powder



Tomato Seeds

### Caustic recovery system.

A portion of our diced tomatoes have the peel removed by a caustic process. Caustic, also known as lye, is a blend of alkaline chemicals that is used to soften the peel of the tomato so that it can be easily removed. After removing the peel, a mixture of lye and water drains off the tomato. The resulting water in this mixture is boiled off, resulting in a more concentrated caustic that can then be reused. Through the implementation of this caustic-recovery system, we managed to reduce our consumption of caustic by 37%. In addition, we have installed two steam peeling lines of near equal capacity to our caustic peelers that use steam to peel, thus requiring no chemical inputs or special handling of the post-peel residual.





# Environmentally conscious packaging and shipping solutions.

The containers we ship our product in are signs of our commitment to conserve and reuse. Just like other resources we use in the enterprise, we encourage our customers to recycle and reuse the containers we ship to them along with the tomato product.



Over **87%** of shipping containers are reused by our customers.

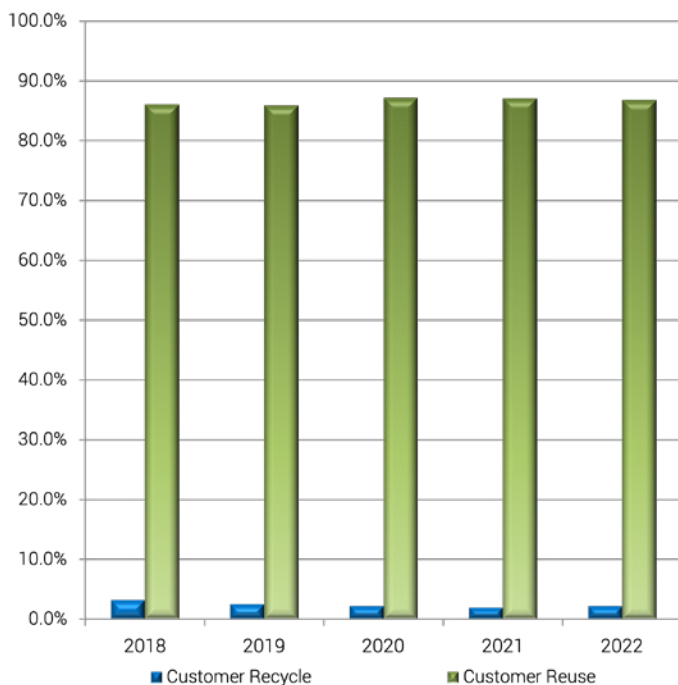


Over **2%** of our shipping containers are recycled by our customers.



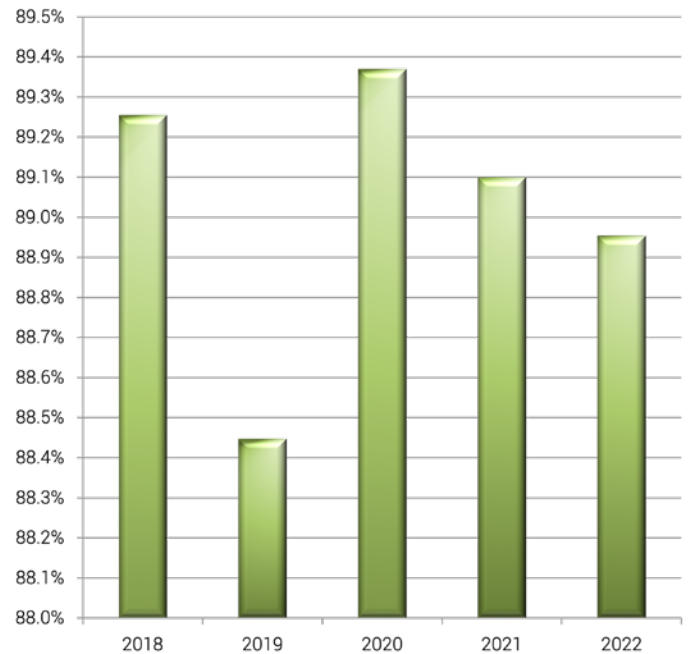
Nearly **11%** of our shipping containers are sent to a landfill or a waste-to-energy program.

**% Shipping Containers Recycle/Reuse**



Source: Morning Star

**% Shipping Containers to Landfill**



Source: Morning Star

## Our fiber drums are 100% recyclable.

By way of our new enterprise partner, California Container Company, Morning Star now internally produces 100% of our fiber drums at our Liberty Packing facility in Santa Nella, CA. By manufacturing fiber drums ourselves, we can eliminate the shipping of close to 1,000 truckloads of empty drums a year, equating to around 80,000 truck miles on the road. In addition, every part of our fiber drum is 100% recyclable. The second-hand market is another source for the reuse of our drums. Internally manufacturing our drums is just another way we have managed to reduce our footprint on the environment.



## Innovative and efficient hauling for a smaller footprint.

Morning Star started in 1970 as a trucking company and trucking is still a vital part of Morning Star. The following steps have since ensured that our transportation needs are met as efficiently and as environmentally friendly as possible:

- Each Morning Star truck hauls two specially designed lightweight trailers which carry, on average, two tons more tomatoes (than the average industry tomato trailer) per trip and still stay under the legal weight limit. This results in fewer trips to transport the same number of tomatoes and reduced emissions. Similarly, all of our drivers are trained and monitored to maximize fuel efficiency on the road through on board engine performance systems. Throughout the tomato season, trucks drive from the tomato field to the nearest Morning Star processing plant, rather than every truck traveling to one central facility.
- The Just in Time Inventory Control system lets our dispatchers know exactly how many trucks are needed where. As part of this system, each of our trucks is equipped with a computer connected to a GPS sensor, so the truck driver always knows their position, their destination, and their route. Additionally, the system works out the logistics of moving loaded and unloaded trailers, resulting in fewer trips and less vehicle emissions.

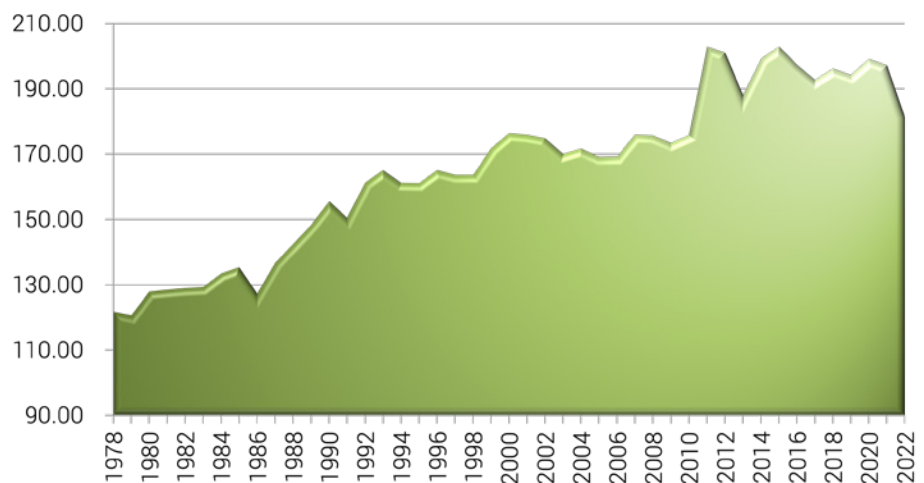
Even with all of these optimizations, railroads are approximately twice as efficient as commercial trucks, particularly for very long distances. Considering that the majority of our products travel to far-away customers, rail freight is the option that makes the most sense, both economically and environmentally. This is why every facility has a dedicated railroad line that we use to ship most of our products.

*Since 1978, The Morning Star Trucking Company has increasingly provided more tonnage to processing facilities while reducing the amount of energy used in transit. The chart below shows the number of tons hauled one mile using one gallon of diesel fuel.*



*Late season rains in 2022 caused for muddy and challenging field conditions, increasing accumulated mud on tomato trailers. This affects net tons hauled, as weight from mud displaces weight from tomatoes. Automated trailer washing systems installed in both the North and South help keep trailers clean, nonetheless these challenging conditions affected overall hauling efficiency.*

**Tons/Gallon per Mile Index**



Source: Morning Star





# Continually innovating to protect the world around us.

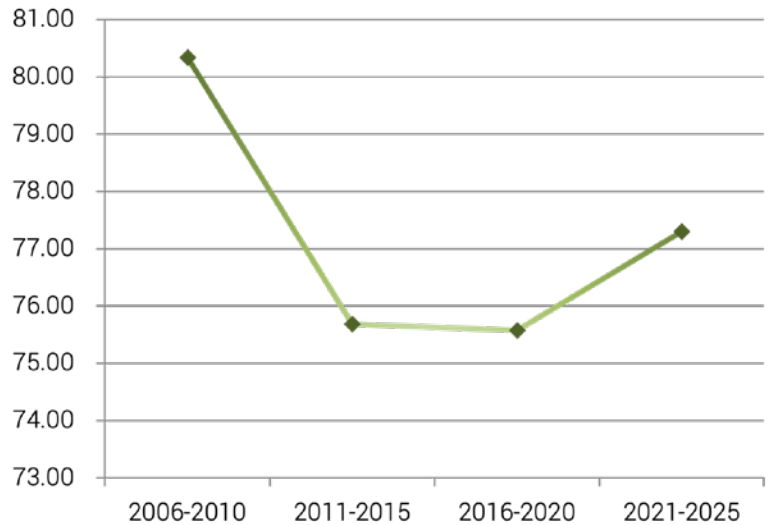
The Morning Star Packing Company is constantly looking to minimize greenhouse gas emissions growth. Over the past decade, we have made significant efforts to manage our emissions growth while continually balancing the fluctuations in our environment and industry demand for product.



California's recent drought and new groundwater sustainable pumping restrictions have led to a decrease in acreage in traditional growing regions. Consequently, processors must now travel longer distances to secure acreage for production. In 2022, this trend was particularly evident, with the highest recorded average miles per load, surpassing the previous drought year in 2014 by only 2 miles per load. These longer hauls require more diesel for transporting loads from the field to the factory, as well as for moving agricultural equipment and teams across extensive areas of the state.

Fortunately, efficiencies achieved through combined cycle natural gas power generation have helped curb our overall greenhouse gas production, resulting in a more muted increase.

**Greenhouse Gas KG per MT Raw Fruit Processed**



Source: Morning Star



## Safety comes first.

In an effort to minimize the health risk to our colleagues and the environment, Morning Star creates, maintains and constantly reviews detailed contingency plans on what to do if there is a hazardous chemical spill. These plans are on-site, and additional copies have been filed with the appropriate authorities. In addition, there are several different training courses that all colleagues have to undergo before working directly with any harmful chemical.

Chemical management and preventing exposure to the environment is a high priority to the Morning Star enterprise. The maintenance of Safety Data Sheets is important, although typically requires thousands of sheets of paper. In order to maintain the most current SDS information and make it available to any colleague at any time, the SDS profiles are maintained in an electronic database. All colleagues have access to this system which uses considerably less resources than conventional hard copy distribution.

Our colleagues are thoroughly trained on proper safety procedures for handling, using, monitoring and disposing of chemicals. Every effort is made to ensure that chemical applications do not threaten or harm the local environment or wildlife.



## Meet our enterprise team.

FIRE  
ROASTED  
SALSA

Morning Star provides vertically integrated services with the support of our enterprise companies.



Partnership since 2003



Founded in 1970



Founded in 1995



Founded in 2000



Purchased in 2009



Partnership since 1992



Founded in 2017

Ask your sales colleague about our extensive line of innovative value-added products.



PASTE



CONC. CRUSHED



GROUND IN PUREE



PUREE



DICED IN JUICE



FIRE ROASTED SALSA



GREEN DICED



GREEN CRUSHED



FIRE ROASTED  
GREEN CRUSHED



RED CHILE PUREE  
(GREEN CHILE OPTION)



DICED IN JUICE  
WITH CONCENTRATED  
TOMATO



FILTERED TOMATO  
CONCENTRATE  
(AGED OPTION)



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