

**SAMSUNG**  
AUSTIN SEMICONDUCTOR

.....  
**2017**  
.....

.....  
**CORPORATE  
SOCIAL RESPONSIBILITY  
REPORT**  
.....

**GLOBAL RESPONSIBILITY  
LOCAL IMPACT**



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## OUR VISION

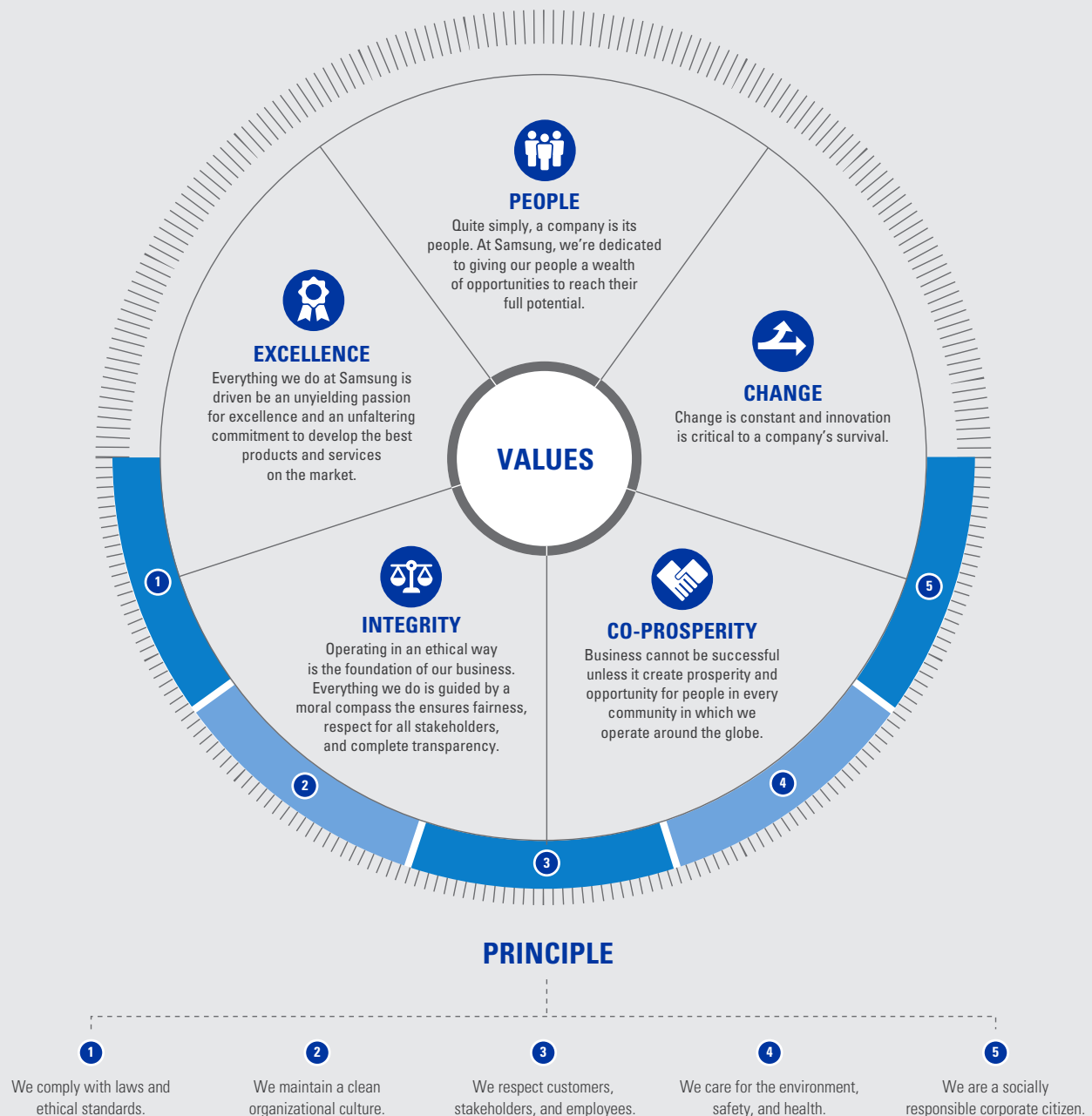
Samsung Austin Semiconductor (SAS) is proud to be a member of the greater Austin community, taking our responsibility as a corporate citizen seriously. While we are aligned with the global sustainability vision of our parent company, Samsung Electronics, at SAS we are also committed to being good neighbors and respectful stewards of local natural resources. We have developed a local sustainability program that addresses the unique needs of this beautiful region and allows our employees to give back to their hometown.

# Samsung Electronics' sustainability philosophy is the harmonious co-existence of people, society, and the environment.

## SAMSUNG PHILOSOPHY

To devote our human resources and technology to create superior products and services, thereby contributing to a better global society.

SAS shares these Samsung Electronics' CSR values and is dedicated to fulfilling our share of responsibility in meeting the corporate commitments expressed in the annual Samsung Electronics' Sustainability Report.



## ABOUT US

SAS is one of the largest and most advanced semiconductor manufacturing facilities in the United States, with over 3,000 employees throughout a 300-acre complex. In over 2.3 million square feet of facility space, SAS employees produce a range of digital large scale integrated components for smart phones, tablets and other mobile devices.

### 2016 DATA



**95%** Recycling Rate



**20%** Reduction of Reportable Incidents



**\$3.6 Billion** Input for the Local Economy

## OUR APPROACH

*Inspire the World.  
Create the Future.*

This report is SAS' first effort to document our sustainability journey. We developed our strategy and program following an internal process that reviewed and integrated the sustainability requirements, guidance, and priorities set within the semiconductor industry, our global company commitments, and the local needs within Austin. The United Nations' Sustainable Development Goals (UN SDGs), Global Reporting Initiative (GRI), City of Austin, and the Electronic Industry Citizen Coalition (EICC) are all integral to the targets, programs, reporting and analysis we used to establish the benchmarks presented in this report as well as setting guidance for future progress against targets.

In some areas, we are making real progress and have established a solid baseline from which we can continually improve our performance –by 2016, we already reached our parent company's 2020 goal to meet a 95% recycling rate. In other areas, we are solidifying our approach and will be setting clear targets for future improvements. For example, UN SDG Goal 5.5 states: "Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life." We share a commitment to this goal with Samsung Electronics and have made progress with our Women in Technology at Samsung (WITS) group, looking to do more in the future to advance women's leadership at and looking to expose more girls and women to careers in the STEM field at SAS and throughout Austin.

## SAS'S ENVIRONMENTAL PROGRAM APPROACH IS BASED ON THE FOLLOWING:

### Preservation of the Local Environment:

By expanding activities to preserve the local environment and communities, and to counteract global warming, SAS provides transparent account of its Green Management practices and results to all stakeholders.

### Product Stewardship throughout the Lifecycle:

By developing products that are safe and are less of a burden to the environment, SAS strives to uphold our responsibility for our environmental impact contained at each stage of the product life cycle, from design and manufacturing, to purchase and usage; to end-of life processing and disposal.

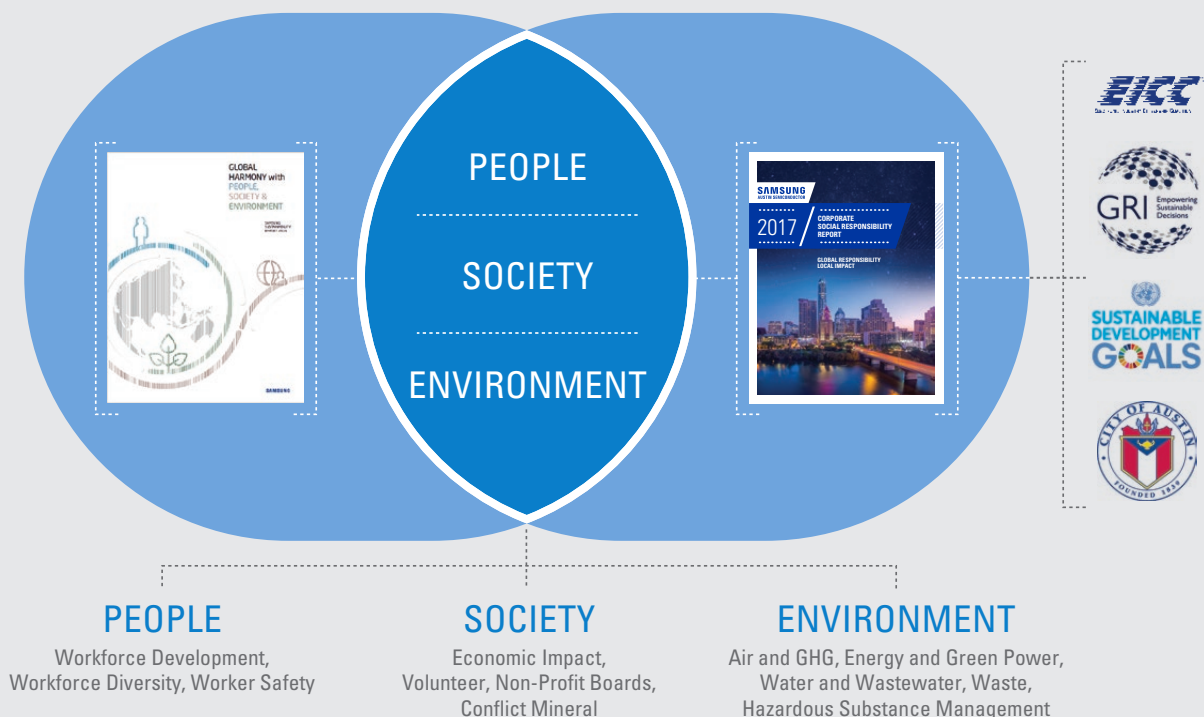
### Clean and Green Process:

By utilizing optimal eco-friendly production technologies, SAS strives to establish a green production process that minimizes the use of energy and natural resources, and reduces greenhouse gas emissions and other materials which harm the environment. Each Samsung facility also strives to recycle resources through resource recovery processes.

### Create Accident-free Facilities:

By eliminating risk factors in advance, SAS seeks to establish facilities that prioritize employee health and safety. Each Samsung facility also strives to recycle resources through resource recovery processes.

## GLOBAL RESPONSIBILITY, LOCAL IMPACT







## PRESIDENT'S MESSAGE

Dear Stakeholders,

I want to express my thanks to all of the individuals who contributed to this, our first SAS Corporate Social Responsibility Report. My gratitude extends to every single employee here, who comes to work every day with a commitment to creating superior products that contribute to a better society. It also includes the local leaders and citizens who engage with us, challenge us, and help us fulfill our intention to be good neighbors and respectful stewards of local natural resources. Lastly, I want to acknowledge a group of internal leaders who prioritized and designed our approach. Our sustainability program encompasses a range of initiatives that keep us all focused on creating a better world while increasing the company's economic value.

We will continue to fulfill our responsibility as a corporate citizen within the Austin community while creating superior products that contribute to a great global society.

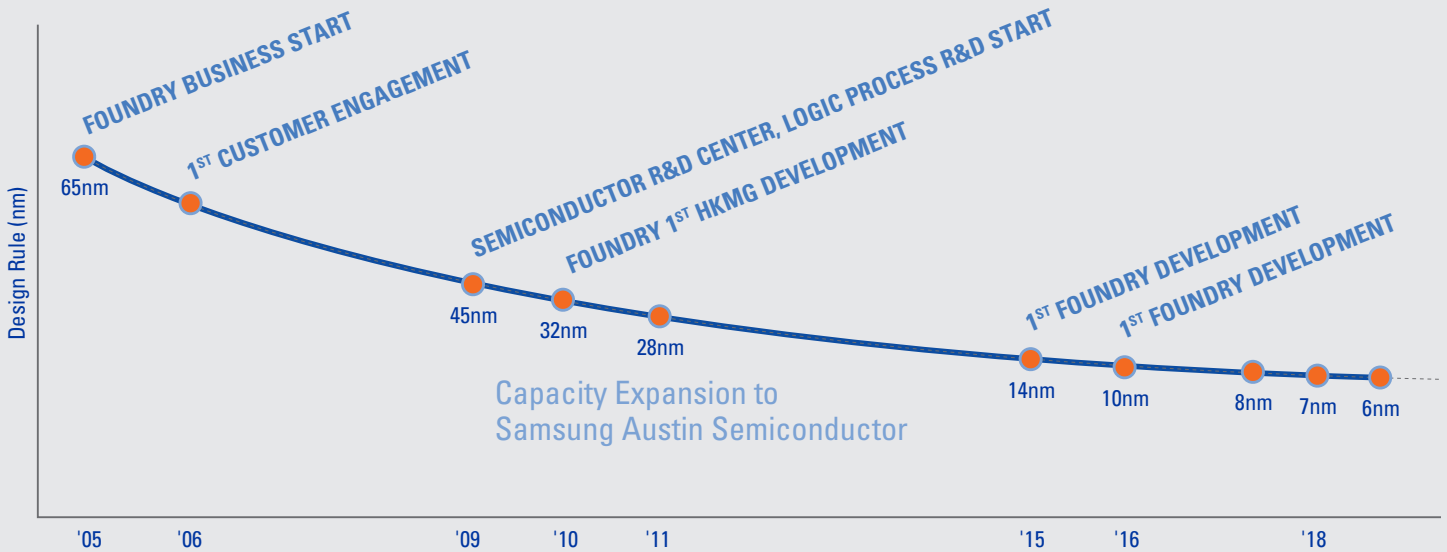
Respectfully,

*Chan Hoon Park*

**Chan Hoon Park**  
President

# OUR BUSINESS

Samsung started its Samsung Foundry business in 2005. Since then, billions of dollars have been invested and the investment will continue in capacity expansion to Samsung Austin Semiconductor (SAS), providing a world-class infrastructure to its customers.







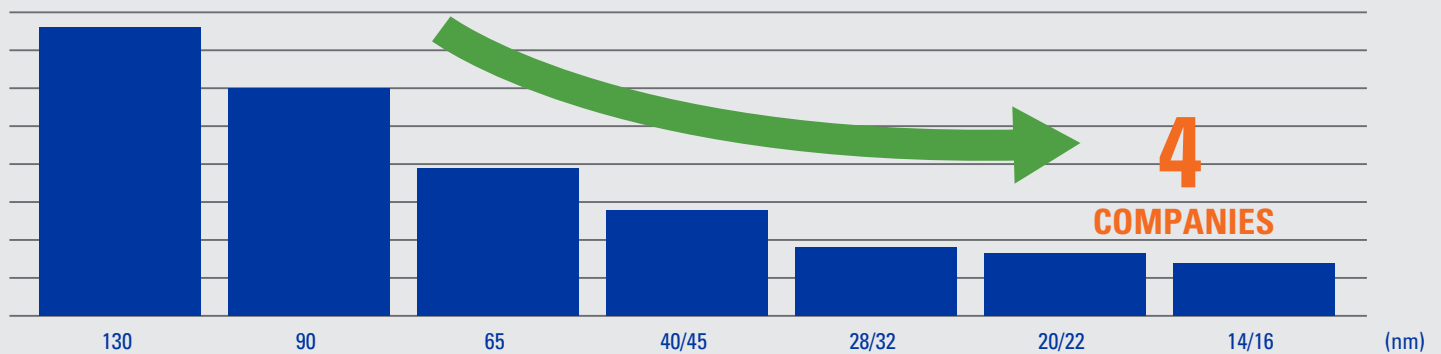
SAS is dedicated to providing customers with a complete and reliable path to product development and production – leading to shortened development time, reduced risk, and first-pass success.

SAS is a trailblazer in leading-edge technology in Foundry Service Companies. To sustain leading-edge technology, SAS is diversifying products and continuing to improve product quality. This includes preparing for the automotive industry and qualifying for TS16949 ISO standard in 2017.

## FOUNDRY SERVICE COMPANIES

Only 4 foundries, including Samsung, can provide leading-edge technology

**22**  
COMPANIES




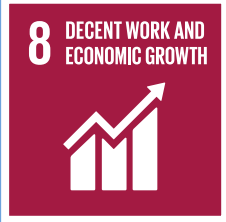

# UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

At the UN General Assembly in September 2015, the Sustainable Development Goals (SDGs) were formally adopted to be carried out from 2016 to 2030 as means for governments, society and business to achieve the globally shared purpose of establishing a sustainable society across the world. Major parts of the SDGs include 17 goals and 167 targets, such as ending extreme poverty, fighting inequality and injustice, and dealing with climate change.

SAS has carefully reviewed and, for our initial commitment, have identified three key goals to which we have focused our efforts, aligning our sustainable management activities with these UN's initiatives. We are in the process of reviewing all of the UN SDGs to determine how we will expand our commitments in 2017 and beyond, further aligning with our parent company's global commitments and ensuring our local efforts best support the needs of the central Texas region.

## UN SDG GOALS FOR SAS:



GOALS			
GLOBAL RESPONSIBILITY	Ensure quality education and promote lifelong learning opportunities for all.	Promote sustained, inclusive and sustainable economic growth, full and productive employments and decent work for all.	Promote resource and energy efficiency.
SAS/LOCAL STATUS	Manor ISD is growing at a rapid pace—adding at least one new school every year for the next five years. As a high needs district with 76% of their student population qualifying for free and reduced lunch, we are able to contribute funds—direct and to nonprofits—who can help provide resources to help students succeed.	Austin-area employers added jobs in 2016 at the slowest pace since the recession, but unemployment remained low and the number of employed Central Texans continued to rise steadily, according to preliminary data released by the Texas Workforce Commission.*	The total remaining MSW landfill capacity in the state at the end of 2015 was 2.79 billion cubic yards. Based on reported compaction rates, this volume would hold 1.87 billion tons of waste and serve for 56 years. However the Austin area would only hold about 75 million tons of waste and serve for 34 years.
CURRENT SAS IMPACT	In 2016, over 600 employees volunteered over 5,000 hours to local organizations. Through the employee giving campaign during the month of November, Samsung will match 100% of \$1,000 to any three 501c3's of the employee's choice. SAS will contribute over \$572,582 in 2017.	SAS invested in a \$1 billion project in 2016. Additionally, SAS pumped \$3.6 billion into Austin's economy. This \$3.6 billion comes from over \$2 billion in direct economic output and an additional \$1.6 billion in indirect and induced output. SAS supported 10,755 jobs in the area and annual salaries of \$498 million.	SAS started at a 91% recycling rate in 2014 and went to 95% in 2016. During that time SAS has recycled 74,258 tons of waste and reduced 44% of its landfill waste.
2020 SAS FUTURE PLAN	SAS will dedicate 1200 employees and 10,000 volunteer hours by 2020.	SAS will invest \$1.5 billion on its semiconductor factory in Texas. This investment will be carried out until 2020, according to statements from the company and South Korea's Chamber of Commerce.	Zero Waste by 2020 with a 98% recycling rate.

\*Austin American Statesman



- WORKFORCE DEVELOPMENT
- WOMEN IN TECHNOLOGY
- EMPLOYEE SAFETY



.....  
**PEOPLE**  
.....

“ Samsung is so often a source of good news in Austin whether it’s about jobs, education, workforce development, housing or helping the homeless. Samsung is a great partner for Austin’s present, and this announcement (about adding new jobs and investment) tells us that they’ll be an even bigger part of our future.”

**Mayor Steve Adler**

**500**

.....  
JOBS

**379**

.....  
VOLUNTEERS

**20%**

.....  
INJURY RATE  
REDUCTION

.....  
MAINTAIN

.....  
OHSAS 18001  
CERTIFICATION

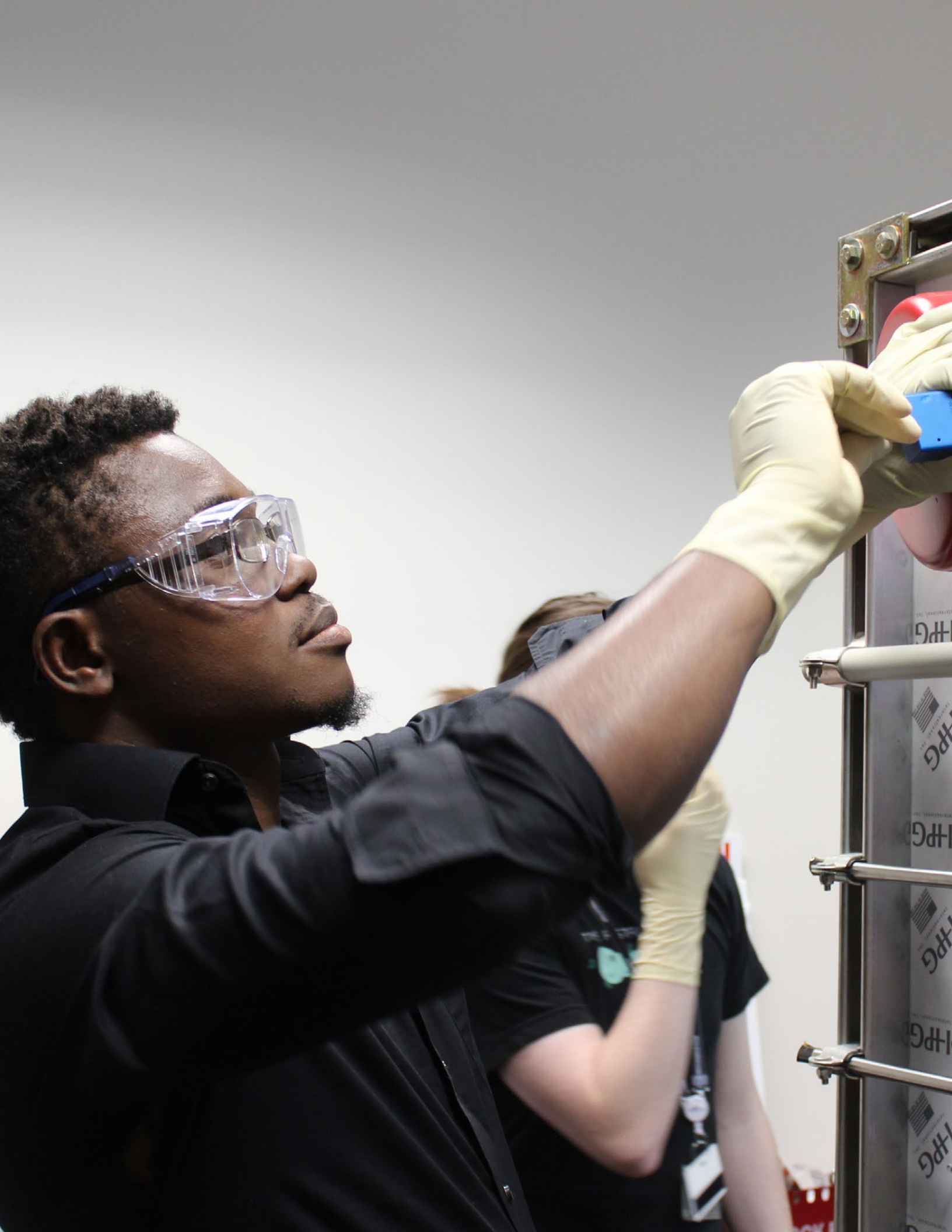


**2016 ASSOCIATION OF  
FUNDRAISING PROFESSIONALS**

Outstanding Large Philanthropic  
Corporation Award

Because we believe that the real power of a company lies in its people, SAS is committed to establishing a creative environment where all of our employees can work safely and with pride while providing opportunities for individual growth and development. We understand our responsibility as a global company doing business in local communities, implementing ethical management while observing all laws and principles. In addition, we continuously work hard to respect and protect human rights, at the global and local levels.







## WORKFORCE DEVELOPMENT

On November 1st, 2016, SAS unveiled our plan to invest \$1 billion in the chip manufacturing facility, which will add up to 500 jobs in Austin, Texas. This investment will help Samsung increase the capacity of the Northeast Austin Manufacturing plant. While making wafers is an extraordinary accomplishment, SAS is focused on creating more middle-class jobs.

“These are big investments,” Catherine Morse, SAS General Counsel said. “These aren’t happening in every community; people lament that there are no more jobs coming to Austin, but these are jobs for ‘Austinites.’”

In addition to creating 500 more jobs, SAS provides training to fill in skills gaps in areas of Engineering and Technical Training through our High School Apprentice program and Internship program. The Apprentice program is an opportunity for first- and second-year Austin Community College (ACC) students to experience the technical working environment at SAS. This program is the second step in the pipeline for hiring our future technicians and engineers.

The objective is to expose prospective employees to the SAS culture and provide them with beneficial knowledge and skills while earning their degree. The High School Graduate Internship program has a similar standard, building a pipeline for future SAS technicians and engineers. The goal is to reach out to students that have expressed an interest in the STEM fields that support the work we do.

**On November 1st, 2016, Samsung Austin unveiled their plan to invest \$1 billion in the chip manufacturing facility, which will add up to 500 jobs in Austin, Texas.**



Approximately 379 members have volunteered or participated in the program throughout the year. Men and women in the group come together to support each other to help each other succeed personally and professionally.

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More than **375** have participated in programs that inspire women to achieve their full potential.

## **WOMEN IN TECHNOLOGY AT SAMSUNG (WITS)**

SAS thrives on innovation, creating a product that can potentially change the landscape of how we operate. As the semiconductor industry grows, it's imperative that technology companies diversify the workplace. Diversity enriches groups, departments, and directors, by including perspectives from people of different backgrounds and genders. According to the Harvard Business Review, 50 percent of women with careers in Science, Technology, Engineering and Mathematics, will eventually leave because of hostile work environments and more. Despite this alarming statistic, SAS believes in cultivating women for leadership roles by supporting the Women in Technology at Samsung group.

WITS is an affinity group for women and men that includes bi-weekly meetings, discussions, volunteer opportunities and more. Participants are uniting, empowering, and inspiring women to achieve their full potential in career, life and leadership for the benefit of SAS. Approximately 379 members have been a part of the group through volunteering initiatives, attending meetings or participating in outreach opportunities throughout the year.





# ZERO

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## ACCIDENT WORK ENVIRONMENT

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In 2016, despite an increase in production, SAS' OSHA Recordable Incident Rate (RIR) decreased 20%.

## WORKER SAFETY

Samsung Global's goal is to create accident-free facilities by eliminating risk factors in advance, prioritizing employee health and safety. SAS is committed to providing a safe working environment for all employees, contractors and visitors. Our ultimate goal is to establish a zero-accident work environment. To do this, we conduct risk evaluation based on our EHS Management System (OHSAS 18001-certified), pursuing continuous improvement initiatives based on evaluation results. If an accident occurs, we conduct a precise safety inspection with the related department to prevent the recurrence of the same or similar accident, identifying the fundamental cause of the accident and then make the necessary improvements. In 2016, despite the increase in production, SAS' OSHA Recordable Incident Rate (RIR) decreased 20% as a result of the continuous identification of potential risk factors.

ITEM	2015	2016	▲
Total Employment	42,345	45,972	↑ 9%
Work-hours	8,416,572	9,481,895	↑ 12%
Recordable Incident Rate	0.10	0.08	↓ 20%

At SAS, our safety culture manages three pillars which comprise the foundation of workplace attitudes and behaviors.

- **The Person** — the sum of the employee’s capabilities, experience, and training
- **The Environment** — the employee’s surroundings, including controls and other workers
- **The Behavior** — how the Person interacts with the Environment and the choices that are made



Safety is always about You!

## RECORDABLE INCIDENT RATE



In most industries, approximately 80% of workplace incidents are caused by improper behavior and unsafe decisions such as the failure to wear protective equipment or lock out an energized piece of equipment. In virtually all cases, when questioned after an incident, workers are aware of the safety requirements but made a choice to put themselves and others at risk by taking a shortcut or otherwise disregarding rules.

At SAS, we work on identifying unsafe behavior and helping employees make corrections while ensuring good two-way communication throughout the SAS facility. Each department is assigned a person who is a familiar and comfortable point of contact for employees in the assigned departments. Then, in each sub department within the manufacturing operations, there is a designated Safety Conductor who is responsible for devoting up to 50% of their time to improving the safety culture. These Safety Conductors are the safety liaisons in the field, and their job is to help SAS drive improvements to keep workers safe.

They do this by:

- Reviewing and communicating safety rules, procedures and checklists
- Conducting audits and weekly safety inspections
- Participating in root-cause investigations and follow-up activities if there ever is an accident or incident
- Handling safety concerns with department contractors

**At SAS we tell all our employees- Safety is always about You!**



- ECONOMIC IMPACT TO THE AUSTIN COMMUNITY
- SUPPORTING EDUCATION
- EMPLOYEE VOLUNTEER EFFORT
- PROTECTION AND CONFLICT MINERAL





# SOCIETY

“Samsung is a bellwether for Austin. As a company that the community and state partnered with to relocate here several years ago, they have far exceeded expectations. Samsung remains a shining example of what happens when we create a business friendly environment.”

**Mike Rollins**  
President, Austin Chamber of Commerce

**\$3.6 Billion**

ADDITIONAL  
ECONOMIC IMPACT,  
ANOTHER  
\$1.5 BILLION BY 2020

**5,000**

VOLUNTEER HOURS

10,000  
VOLUNTEER HOURS  
BY 2020

**100%**

CONFLICT-FREE  
STATUS



**2016 AUSTIN GIVES FINALIST**  
Austin Gives Generous Business Awards

At SAS, we see our business activity as part of a commitment to shared value – when we do well, we must ensure we lift the entire society we depend upon for our continued success. We pursue better lives for humanity using innovative technologies while at the same time continuously working hard to improve disadvantaged people’s accessibility to IT technology. By doing this, we are able to combine the company’s business activities and social contribution activities, ultimately promoting the development of a more sustainable society.







.....  
**SAS supported  
10,755 jobs in the  
area and annual  
salaries of  
\$498 million.**

## **ECONOMIC IMPACT TO THE AUSTIN COMMUNITY**

As one of Austin's top ten employers, Samsung Austin Semiconductor makes a substantial financial impact to the Austin community. According to a 2015 report\*, SAS pumped \$3.6 billion into Austin economy. This \$3.6 billion comes from over \$2 billion in direct economic output and an additional \$1.6 billion in indirect and induced output. The direct impact comes from the operations of our Austin facility and the spending of our employees. Indirect sales, jobs, and salaries are supported in businesses and organizations in the community that supply goods and services to us. These include the cascading effect on restaurants, hotels, banks, grocery stores, service companies and others that provide goods and services to our employees and their families and, in turn, to workers in indirect jobs and their families. SAS supported 10,755 jobs in the area and annual salaries of \$498 million.

**Austin-area employers added jobs in 2016 at the slowest pace since the recession, but unemployment remained low and the number of employed Central Texans continued to rise steadily, according to preliminary data released by the Texas Workforce Commission.**

**— Austin Statesman**

\*SOURCE: Impact DataSource LLS, an Austin TX economic consulting and research analysis firm.





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In 2016 SAS donated over **\$250,000** to support district initiatives and nonprofit programs.

## SUPPORTING EDUCATION IN SCHOOL DISTRICTS

At SAS, we are committed to giving back to the Central Texas community and working directly with several school districts — Austin, Manor, Round Rock, and Pflugerville, to name a few. We believe in building up the our closest neighbors within the local community that surrounds our facility.

The primary school district that we focus our philanthropic efforts on is Manor ISD, due to its proximity to our facility. Manor ISD is growing at a rapid pace — adding at least one new school every year for the next five years. As a high-needs district with 76% of the student population qualifying for free and reduced lunch, we are able to contribute funds — direct and to nonprofits — who provide resources to help students succeed.

In 2016 SAS donated over \$250,000 to support district initiatives and nonprofit programs. Employees are encouraged to volunteer with Manor ISD through programs such as mentoring, robotics or speaking at schools about their careers. SAS works directly with the Superintendent to discuss funding opportunities and supporting the previous years' partnerships. Through this conversation, we collaborate on what programs we will support the following year. By investing time and money into the school districts, we hope to expose students to careers and opportunities and show them they can have a bright future working down the street from where they currently live.



## EMPLOYEE ENGAGEMENT – TIME AND CONTRIBUTIONS

SAS has five areas of focus for corporate social responsibility that align with our UN SDG focus: early childhood investment, STEM education, youth development, environmental sustainability and workforce development. Through these strategic areas, we are able to give grants to over 30 Central Texas nonprofit organizations in addition to thousands of employee volunteer hours. Employees are encouraged to give of their time to organizations they feel passionate about.

Employees learn about the importance of giving back during their first week of work where they hear about SAS' employee engagement initiatives. To accommodate the facility's 24/7 production schedule, SAS makes sure there are opportunities to participate throughout the week and weekend. SAS hosts events and partners with nonprofits on a variety of programs through cleanups, mentoring and volunteering at the food bank.

In 2016, over 600 employees volunteered over 5,000 hours to local organizations. Through the employee giving campaign during the month of November, Samsung will match 100% of \$1,000 to any three 501c3's of the employee's choice. With the employee contribution and employer match, SAS will contribute over \$572,582 in 2017.

## **EXECUTIVES ON NON-PROFIT BOARDS**

SAS' presence in the community is mainly driven by the community affairs team, but there are also several leaders who serve on nonprofit boards in the Central Texas community. In 2016, ten leaders were strategically placed in twelve organizations based on SAS' five focus areas. These SAS employees are able to be great stewards of Samsung in the community in addition to telling their colleagues about their nonprofits and encourage them to volunteer or monetarily support. Spreading Samsung's corporate social responsibility message to the community is vital to our growth as a company

In 2016, ten leaders were strategically placed in twelve organizations based on SAS' five focus areas.



## CONFLICT-FREE MINERAL STATUS






Conflict minerals are the minerals determined by US legislation to be financing armed conflict in the Democratic Republic of Congo (DRC) and the surrounding countries (DRC Regions). The term also refers to the four most commonly mined minerals known as “3TG” — Tantalum (Ta), Tin (Sn), Tungsten (W), and Gold (Au).

Recently, societal and environmental issues caused by the mining of minerals in the DRC and DRC regions became a serious global concern. Samsung Electronics takes its ethical and social responsibility to manage the supply chain seriously, including providing customers with conflict mineral-free products and becoming a leader in responsible procurement. SAS is aligned with Samsung Electronics’ effort to achieve third-party verification for 100% of smelters dealing with tantalum, one of the conflict minerals.

Samsung Electronics’ “Conflict Mineral” policy establishes in-depth inspections and checking of the conflict minerals procurement process. Our policy includes, but is not limited to, procedures that raise awareness among our vendors, investigation of conflict mineral use, audits and verifications, and risk evaluations.

Samsung participates in activities with the Conflict-Free Sourcing Initiative (CFSI), which includes the Electronic Industry Citizenship Coalition (EICC), the Global e-Sustainability Initiative (GeSI), and other participating members and suppliers, to work on real solutions to Conflict Mineral issues.

[http://www.samsung.com/us/aboutsamsung/for\\_partners/](http://www.samsung.com/us/aboutsamsung/for_partners/)

BASIC POLICY	PROVIDING CUSTOMERS WITH PRODUCTS DISTRIBUTED IN A LEGAL AND ETHICAL MANNER				
<b>PROCESS</b>	 Raising supplier awareness	 Investigating the use of conflict minerals in the supply chain	 Conducting a reasonable audit and verification of the results	 Identifying and evaluating the risk factors in the supply chain	 Establishing strategies for risk reduction and reporting the related information
<b>MANAGEMENT SYSTEM</b>	Establishing an online CMRT system (internal) and TCS system (managing conflict minerals by material unit)				
<b>COOPERATION SYSTEM</b>	Engaging in EICC, GeSI, and CFSI activities				



- AIR
- ENERGY
- WATER
- WASTE
- CHEMICALS



**2016 TCEQ**  
Finalist for the  
Texas Environmental  
Excellence Awards

“For years I have been honored to recognize the innovative measures that Texans of all ages, from across the state, take to improve our environment.”

**Bryan W. Shaw, Ph.D., P.E.**  
TCEQ Chairman

# ENVIRONMENT

*SAS is ISO 14001  
and 50001 Certified.*

20%

GREENHOUSE GAS  
REDUCTION

95%

RECYCLING RATE /  
98% BY 2020

8

SEA/SAS HAS MOVED UP  
8 SPOTS ON THE TOP 100  
LIST FROM 70 TO 62

5

CONSECUTIVE  
PRETREATMENT  
AWARDS

75%

REDUCTION OF A  
HAZARDOUS CLEANING  
SUBSTANCE



**PLATINUM/FOUNDING MEMBER OF  
AUSTIN GREEN BUSINESS LEADERS**

## AIR AND GREENHOUSE GASES

Air quality is everyone's concern: especially as it relates to Greenhouse Gases (GHGs). What are the impacts from GHGs and what are they?

Because GHGs can trap heat, which in turn can make the planet warmer, it is important to reduce GHG chemicals to minimize dire planetary consequences. The consensus among 97% of climate experts is that human activities are responsible for almost all of the increase in GHGs in the atmosphere over the last 150 years. The largest source of GHG emissions from human activities in the United States comes from burning fossil fuels for electricity, heat, and transportation. The primary greenhouse gases in Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone. Of these, carbon dioxide is the one most countries and companies are focused on.

On a global basis, the Paris Agreement negotiated that signatory countries, by 2020, would work on greenhouse gas emissions mitigation, adaptation and finance incentives, and allowed each country to determine, plan and regularly report its own contributions that it should make, in order to mitigate global warming or climate change.





## **CARBON NEUTRAL BY 2020**

The City of Austin (COA) initiated its own Climate Program, which outlines City efforts to implement strategies that address the climate change challenges for Austin. The COA goals are to have Carbon neutrality for COA operations by 2020, Net-zero community-wide greenhouse gases by 2050, and, effective strategies for resilience in the face of climate-related threats. They have also asked citizens and companies to take individual steps to reduce carbon.

SAS is taking steps to reduce GHGs by successfully compiling mandatory information for the Greenhouse Gas Reporting Program (GHGRP), and by calculating & reporting 2016 GHG emissions data to US Environmental Protection Agency (EPA).



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**SAS has achieved a GHG 20% reduction (Normalized) from 2015 to 2016.**

The GHGRP collects facility-level GHG data from major industrial sources across US. Facilities that emit over 25,000 metric tons of CO2e (CO2 equivalent, a measure of GHG intensity) per year are required to report to the EPA. SAS falls in this category. However, compared with other industries, like power plants and oil and gas refining, electronics manufacturing has a lower CO2e impact than these other more combustion-intensive industries.

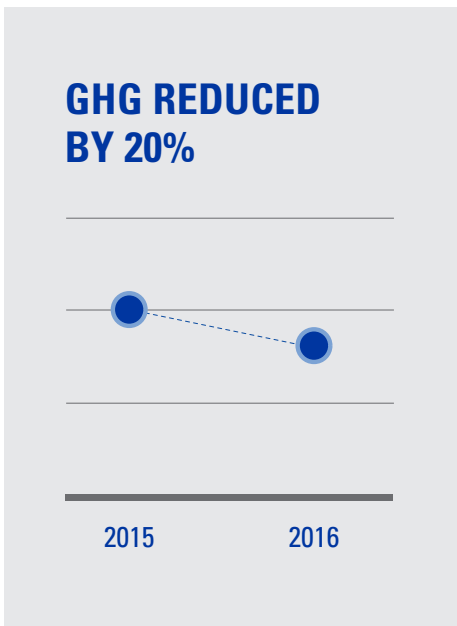
SAS voluntarily goes above and beyond to monitor and reduce GHGs. We do this to make our Austin site more sustainable, and to be a responsible corporate citizen in our city. At SAS, site-wide GHG emissions are primarily due to the use of fluorinated compounds within process materials, for the use of heat transfer fluids, and by our overall fuel usage.

Besides working with the EPA, SAS engages with other GHG stakeholders, including the World Semiconductor Council, the Semiconductor Industry Association, and the Korean Semiconductor Industry Association, to work on reducing GHGs within our facility. These GHG stakeholder engagement activities allow SAS to have access to valuable information that is necessary to manage on-site GHG emissions properly and efficiently.

Over several years, the Facilities Environmental team has made a continuous effort to support its manufacturing operations in reducing GHG emissions by managing materials that have GHG emissions capabilities. We looked at using less of these materials (like fluorinated compounds) and changing out manufacturing equipment. This has allowed us to observe a GHG 20% reduction (Normalized) from 2015 to 2016.

SAS also is helping Austin stay in a better air quality zone by reducing ground level ozone or “bad ozone” with reduction activities on nitrous oxide (NOx) and volatile organic compound (VOC) emissions. In 2015 our NOx reduction was about 228 tons CO2 equivalent/year, and our 2016 VOC emission was reduced by about 9 tons.

Additionally, SAS has purchased green choice power for the last six years. The work we do to manage air quality and to reduce GHG emissions keeps us on track with our Samsung global climate change and operational energy efficiency goals, as well as helping COA with their carbon neutrality objectives.





SAMSUNG



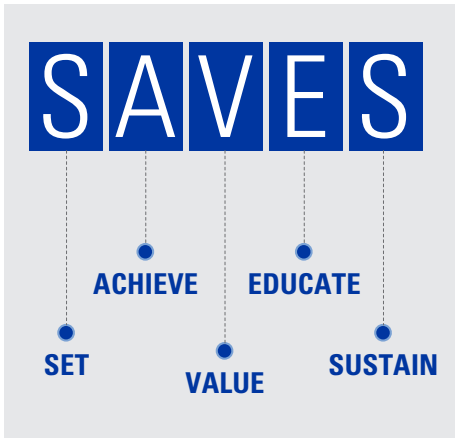


## ENERGY AND GREEN POWER

Green power is zero-emissions electricity that is generated from environmentally preferable renewable resources, such as wind, solar, geothermal, biogas, eligible biomass, and low-impact hydro. Using green power helps build demand for the development of new renewable energy capacity nationwide and helps users reduce their carbon footprints. EPA's Green Power Partnership is a voluntary program that encourages organizations to use green power as a way to reduce the environmental impacts associated with electricity use. Samsung is using 113 million kilowatt-hours (kWh) of green power annually, which represents 14 percent of our total power needs. The company's choice to use green power is helping to advance the green power market and support clean renewable energy alternatives.

Samsung is using  
113 million kilowatt-hours (kWh)  
of green power annually, approximately  
14% of our total power needs.





In addition to green power usage, other activities are being conducted to save on energy and to reduce SAS's carbon footprints. This includes SAS becoming certified under the International Standards Organization (ISO) energy management program known as ISO 50001. Our Energy Policy under ISO 50001 is embodied by the SAVES acronym: *Set; Achieve; Value; Educate; Sustain*

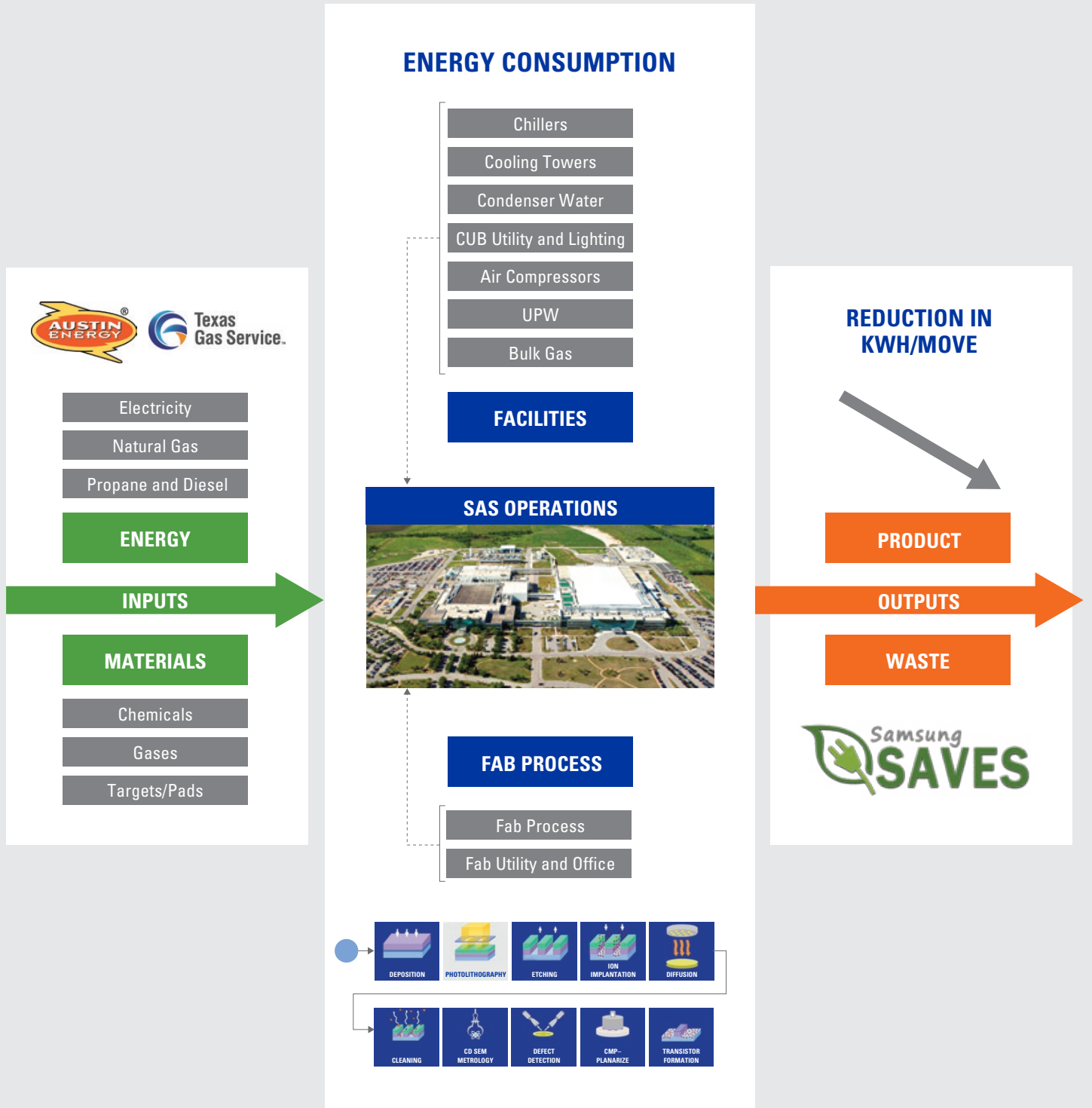
SAS *Sets* improvement targets based on careful consideration of historical performance in order to *Achieve* meaningful reductions in consumption while *valuing* energy efficiency. SAS strives to *Educate* employees and external interested parties about our conservation efforts so we can *Sustain* best practices and be a leader in energy process innovation.

Some of the ways SAS demonstrates energy leadership include:

- Point of Use Abatement (POU) Efficiency
  - POU efficiency consists of monitoring and reviewing processes in our local gas scrubbers. The system uses significant amounts of natural gas, and by monitoring and reviewing the scrubber efficiencies, SAS can contribute to reducing its carbon footprint and saving energy.
- LED Lighting Replacements
  - SAS has installed LED lighting to replace conventional lighting in non-manufacturing areas site-wide to save lightbulb replacement and to save energy.
- Chiller Replacements
  - SAS demonstrated the value of investing long term in energy-efficient equipment when we replaced one of our Chillers with a more modern unit.



# ENERGY PROCESS MAP SHOWS THE ENERGY SAVINGS BY SAS.







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**We have re-used a total of 435,000 tons of H<sub>2</sub>O in our cooling towers and condensate water systems.**

## **WATER AND WASTEWATER**

Today, there are over 663 million people living without a water supply close to home, spending countless hours waiting or trekking to distant sources, and coping with health impacts of using contaminated water. The quality and quantity of water are equally important; it was not that long ago that Austin was in a serious drought. Water is a precious commodity and SAS is doing its part to recycle and re-use the water supply we purchase from the City as a way of conserving water and reducing its use. We also help improve water quality by our wastewater system.

SAS reuses water from the manufacturing processes on-site as well as the ultrapure water circulating in our cooling tower. In 2016 we reused 420,000 tons of H<sub>2</sub>O and over 15,000 tons of water in the condensate water system within our air-handling units. We used that saved water in our landscaping irrigation system, thus reducing use of City Water.



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**SAS received the  
“5 Years Excellence Award”  
from the City of Austin  
for successful wastewater  
pretreatment in 2011-2016.**

SAS also was recognized for excellence in wastewater pretreatment from 2011 to 2016 and received the “5 Years Excellence in Pretreatment Award” from the City of Austin. This Award honors distinguished Significant Industrial Users (SIUs) who exhibit environmental stewardship by proactively preventing pollution and managing wastewater discharge. Winners clear a very high bar for pollution prevention excellence.

SAS also helps to conserve water by educating our employees on the importance of water-saving measures and by helping preserve natural aquatic resources in the Austin area. March 22 has been officially designated by the UN as World Water Day. SAS helped to celebrate 2016 World Water Day with awareness-raising activities, and a creek cleanup.







## WASTE

The United Nations' Sustainable Development Goals (SDG) number 12 encourages sustainable consumption and production with an adherence to international norms on the management of hazardous chemicals and wastes. For example, there is a directive on the control of transboundary movements of Hazardous Wastes disposal.

The City of Austin has a goal of Zero Waste by 2040, which means keeping at least 90 percent of discarded materials out of the landfill. This follows the framework of a circular economy — re-using rather than throwing away — that Samsung Global observes. While the City of Austin has a zero waste goal by 2040, SAS has established a goal of reaching “Virtually Zero” waste by 2020. SAS started at a 91% rate in 2014 and went to 95% in 2016. During that time SAS has recycled 74,258 tons of waste and reduced 44% of landfill waste.

This supports the City of Austin's concern about the total remaining MSW landfill capacity in the state — at the end of 2015 it was 2.79 billion cubic yards. Based on reported compaction rates, this volume would hold 1.87 billion tons of waste and serve for 56 years. However, the Austin area would only hold about 75 million tons of waste and serve for 34 years.\*



## ZERO WASTE BY 2040

### Underwriter's Laboratory defines “Virtually Zero” at 98% recycling rate

\* TCEQ Report

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In two years, SAS increased its recycling rate **from 91% to 95%**; reducing 44% of our landfill waste.

SAS is diligently working towards achieving its Virtually Zero goal by segregating waste materials on-site to maximize the recycle potential. Various recycling options are available to all employees to dispose of their waste in the most sustainable manner possible. In addition, periodic training is provided to employees to improve site-wide awareness. This helps SAS to promote efficiency and sustainability in waste production.

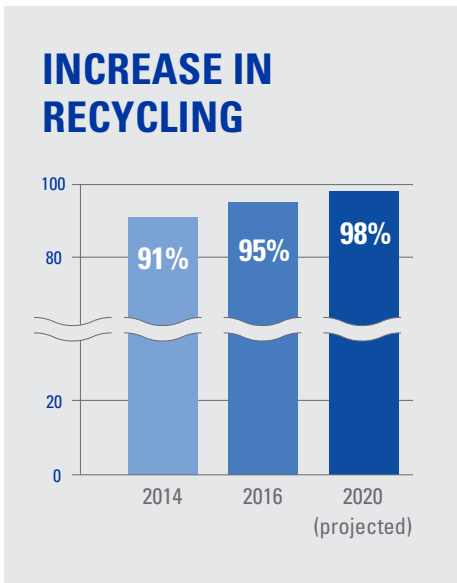
By recycling, SAS can limit the amount of waste that goes into landfills, thus saving natural resources like land, water and air. SAS has also established management plans for each process (production, transportation and disposal) that comply with all applicable regulatory requirements and improve our recycling rates.

Waste Management Plan carefully looks at our site-specific production and generation of waste, which results in the continual improvement of our waste-recycling goals by effectively segregating out all waste streams and by reinforcing employee awareness of SAS's recycling activities. The Waste Plan also looks at the transportation of waste and ensures that there is compliance with hazardous waste transportation laws.

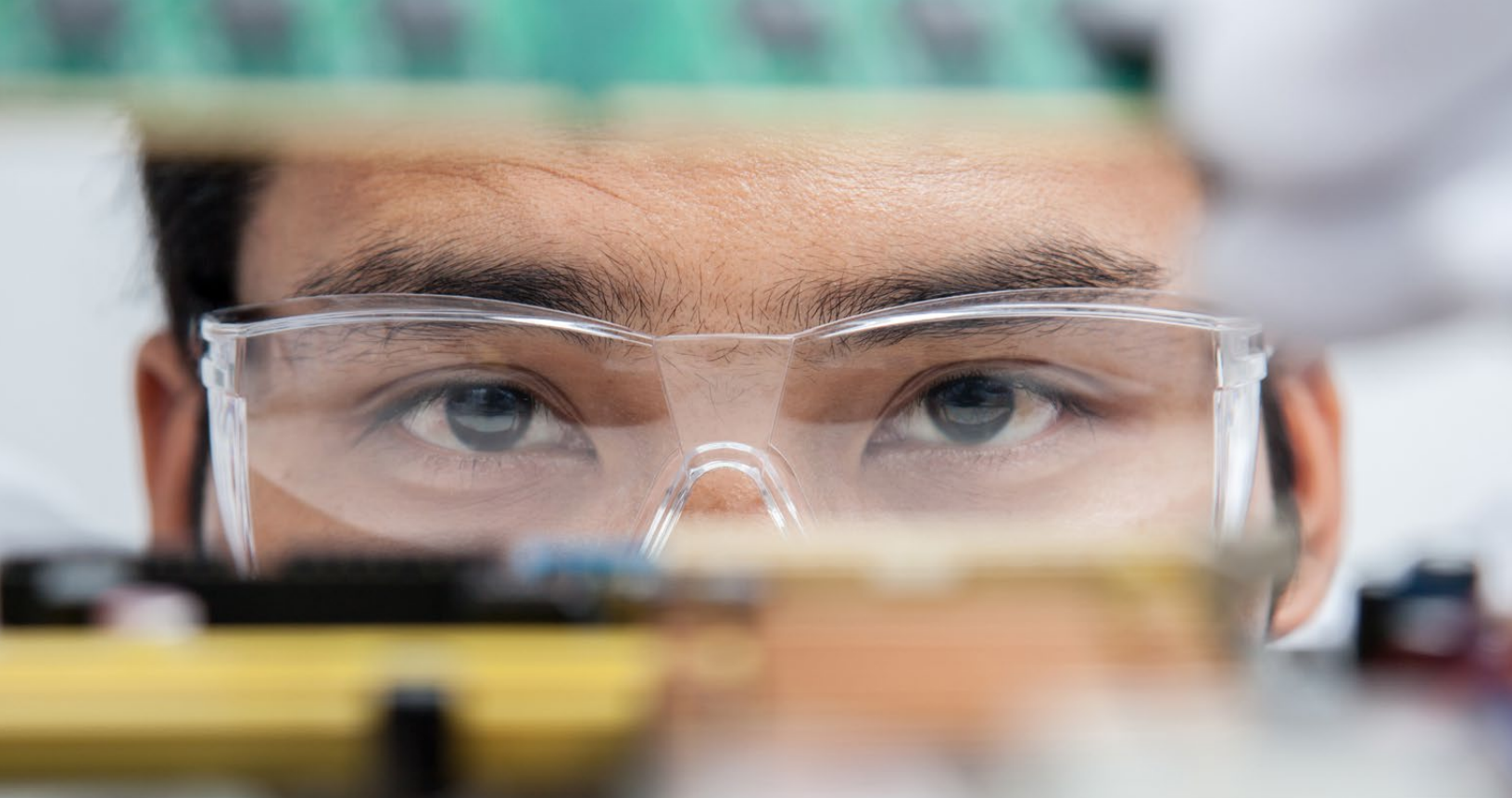
We do this by our monitoring the routes of vehicles carrying waste, to ensure they go to a proper disposal site. The safety of our transporters, as well as all others on the road, is of utmost importance to SAS. All waste transportation vessels are verified for compliance during transit, upon arrival, and again prior to departure from the disposal site.

The ultimate disposal of SAS waste is also addressed in the Waste Management Plan which includes verification of waste treatment compliance through periodic inspection of waste-processing companies. All SAS waste receiving facilities are verified prior to use by third parties who perform initial facility inspections. SAS representatives also audit each waste disposal/ recycling facility to ensure that SAS standards are followed, and that proper waste treatment methods are incorporated to validate the "Cradle to Grave" responsibility that SAS has for its generated wastes.

This monitoring and auditing program helps SAS work within the directive on the control of transboundary movements of Hazardous Wastes disposal — part of UN SDG No. 12 — and our recycling program helps the COA's goal of keeping discarded materials out of landfills.







UNIVAR USA INC.  
 ISSUE DATE: 2016-05-18  
 Annotation:

SDS NO: 10000025  
 VERSION: 002 2016-05-18

**UNIVAR**  
 3070 Highland Plaza, STE 200  
 Danvers, CA, 95615  
 435-895-3400

**SAFETY DATA SHEET**

**1. Identification**

**Product identifier:** SULFURIC ACID w/more than 51%

**Other means of identification**  
**SDS number:** 00010000025

**Recommended use and restriction on use**  
**Recommended use:** Reserved for industrial and professional use.  
**Restrictions on use:** Not known.

**Emergency telephone number/For emergency assistance involving chemicals**  
 call CHEMTREC day or night at: 1-800-424-9300. CHEMTREC INTERNATIONAL Toll 703-527-3887

**2. Hazard(s) identification**

**Hazard classification**

<b>Health hazards</b>	
Skin corrosion/irritation	Category 1A
Serious eye damage/eye irritation	Category 1
Carcinogenicity	Category 1A
Environmental hazards/Acute hazards to the aquatic environment	Category 3

**Label elements**

**Hazard symbol**

## HAZARDOUS SUBSTANCES MANAGEMENT

The United Nations' Sustainable Development Goals (SDG) number 12 besides addressing the management of hazardous waste, also addresses protocol for producing and using hazardous substances. The semiconductor manufacturing process requires hundreds of chemicals to produce highly complex and progressively smaller integrated circuit chips. As semiconductor complexity increases, new chemicals are developed and used to advance and achieve the next generation of new technology.

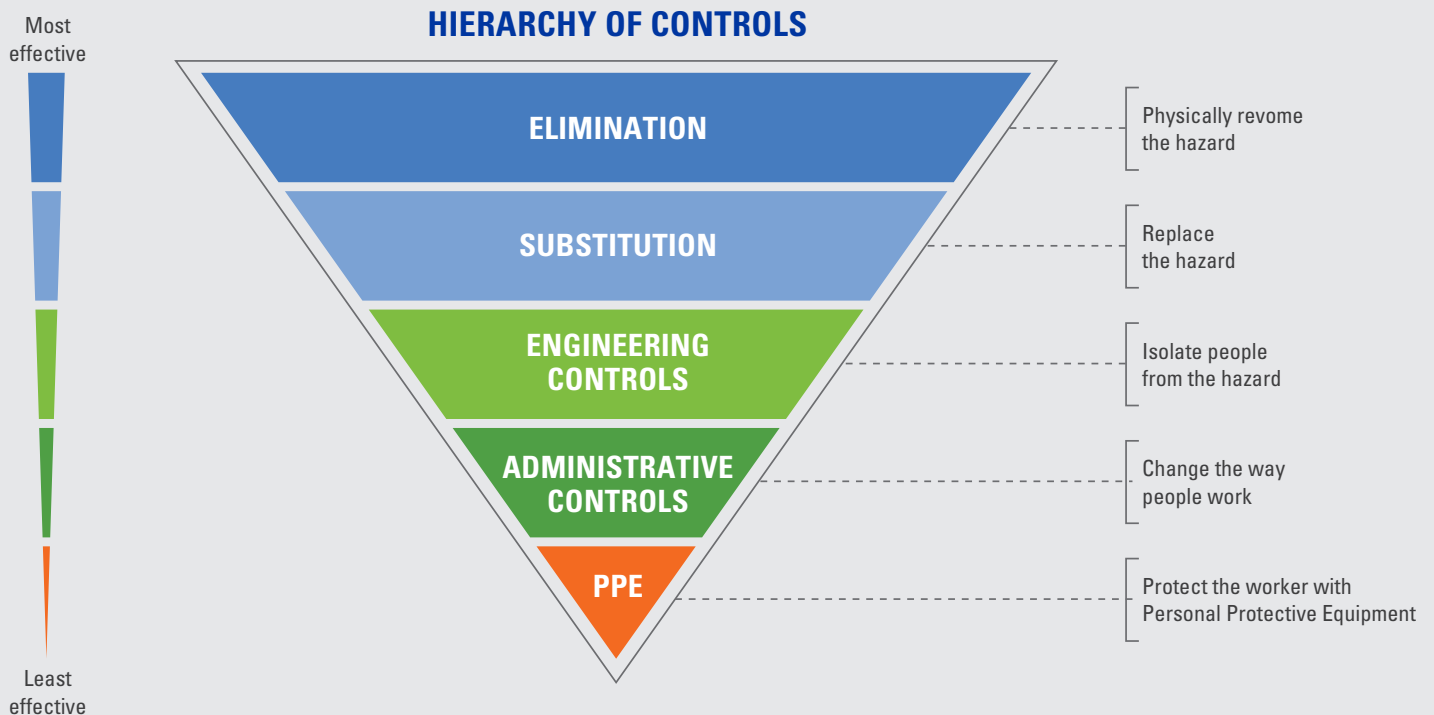
Unavoidably, new chemicals produce hazardous substances, which may in turn produce hazardous waste and cause potential exposure issues to employees. SAS recognizes the importance of controlling hazardous substances to ensure the safety of people and the environment.

SAS manages its hazardous substances from the evaluation process to the disposal stage. We do this by a thorough evaluation purchasing process, by how we receive and use new chemicals, and by how we disposal of the chemical once it has become a waste. We continuously evaluate new chemicals by using a systemized material review form and by evaluating all potential risks of using that chemical, including compliance with local, national, and global requirements before the chemical is even brought on-site.

SAS's Logistics team reviews the incoming new chemical to make sure it has proper labeling and safety data sheet information so that workers are aware of the potential hazards of the new chemical. Wherever possible, SAS has task force teams see if there are less hazardous substitutes to use for a particular chemical to reduce employee risk, and of course, to track the ultimate and proper disposal of that substance once it is ready to be discarded.

Besides evaluating risks, ensuring compliance with usage, finding less hazardous substances and ensuring proper disposal, SAS utilizes the "Hierarchy of Controls" (HOC) method to regularly evaluate hazardous substances for possible reduction opportunities, and to make improvements to the work environment. Using this HOC method, SAS recently was able to reduce the usage of a particular cleaning chemical usage by 75%! To ensure SAS continues to work with hazardous substances in the best manner practical, SAS represents our company on an industry association group to address a variety of chemical-related technical issues.

Currently the group is focusing on general chemical usage, on the potential of new chemical ions and their possible impacts when these molecules are released into wastewater, and on the increased use of nanomaterials in manufacturing processes. Through these collaborative activities, SAS gains knowledge about current and future hazardous substances concerns and trends, and is better able to keep SAS employees, contractors, and the environment from potential chemical risks.





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Samsung Campus,  
Austin Texas









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The image features a dark blue background with a starry pattern. A blue banner with white text and two white diagonal lines is positioned in the upper right. Below the banner is a night-time photograph of a city skyline with illuminated buildings and a bridge over a river.

**SAMSUNG**  
AUSTIN SEMICONDUCTOR