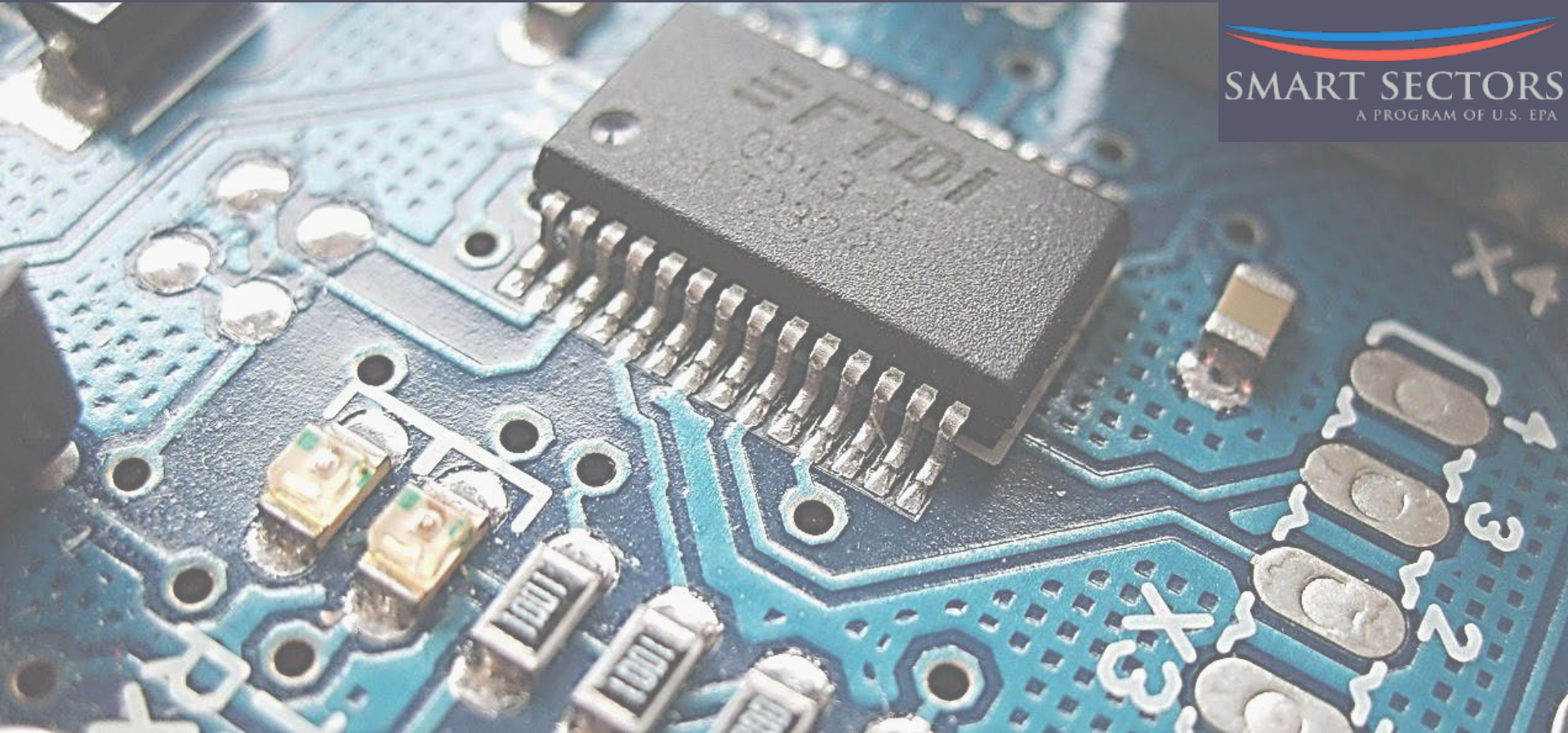


# ELECTRONIC PRODUCTS & SEMICONDUCTOR MANUFACTURING



SMART SECTORS  
A PROGRAM OF U.S. EPA



ECONOMICS



ENVIRONMENTAL  
IMPACT



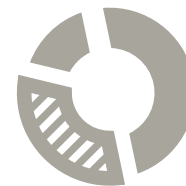
EFFICIENCY

# ELECTRONIC PRODUCTS & SEMICONDUCTOR MANUFACTURING



**The electronic products manufacturing sector employs approximately 1,081,000 people in the U.S.**

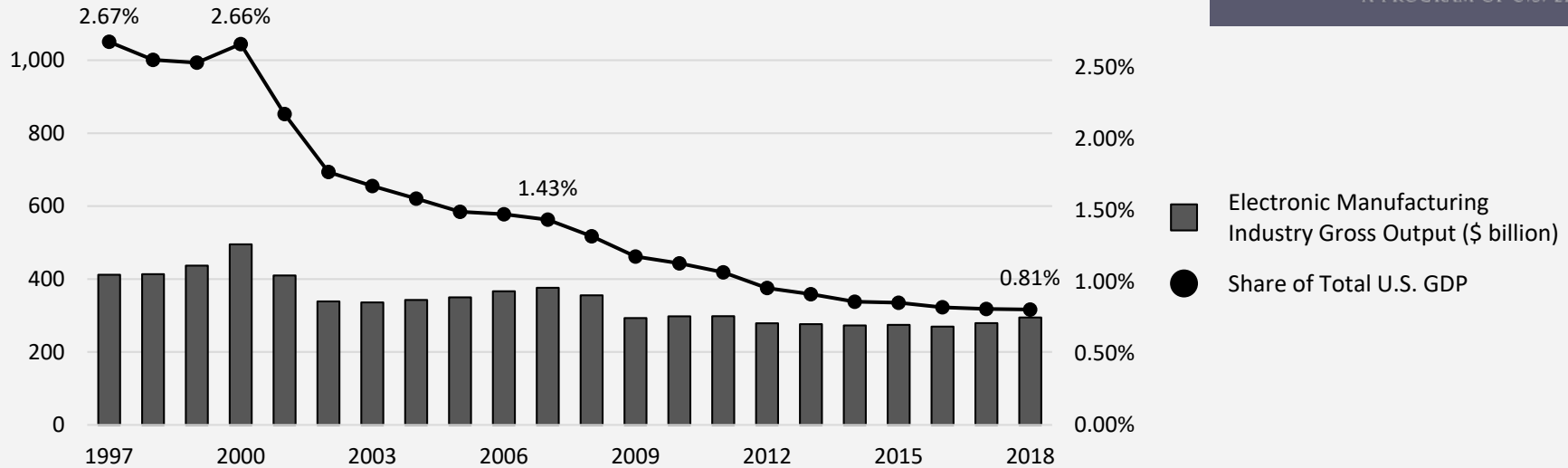
*Bureau of Labor Statistics, 2019*



# ELECTRONIC PRODUCTS & SEMICONDUCTOR MANUFACTURING



## U.S. Electronic Manufacturing Industry's Share of GDP



**Between 1997 and 2018, the electronic manufacturing industry's share of GDP has decreased from 2.67% to 0.81%, while gross output has decreased from \$412 billion to \$295 billion.**

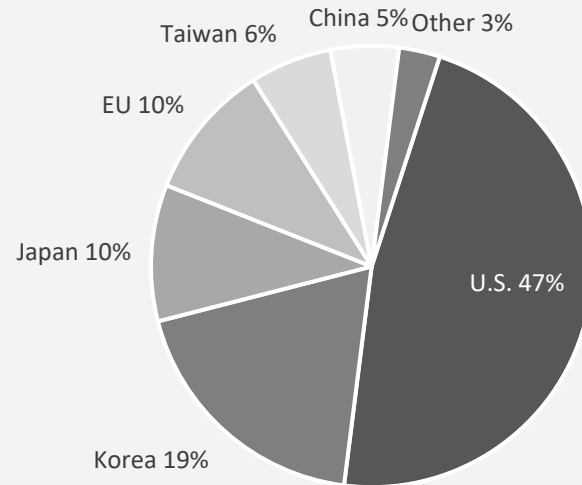
*Bureau of Economic Analysis, 2019*



# ELECTRONIC PRODUCTS & SEMICONDUCTOR MANUFACTURING



## U.S. Semiconductor Industry Share of Global Market (2019)



**In 2019, semiconductors produced by U.S. firms constituted 47% of the global market.**

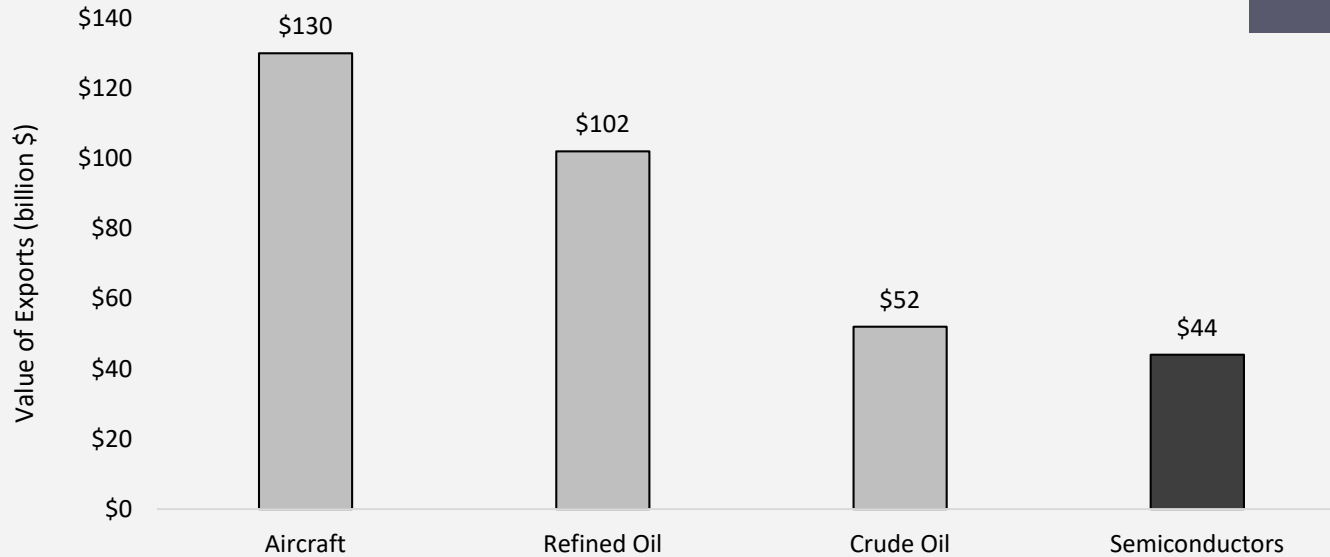
*Semiconductor Industry Association, 2020*



# ELECTRONIC PRODUCTS & SEMICONDUCTOR MANUFACTURING



## Top 4 U.S. Exports (2018)



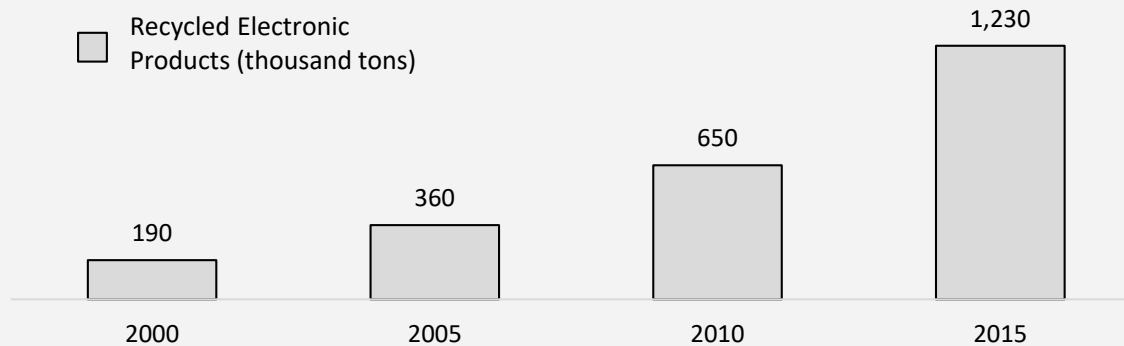
**Exports of semiconductors were worth \$44 billion in 2018, ranking fourth among all products in the U.S.**

*International Trade Commission, 2019*





## Electronic Products Recycling



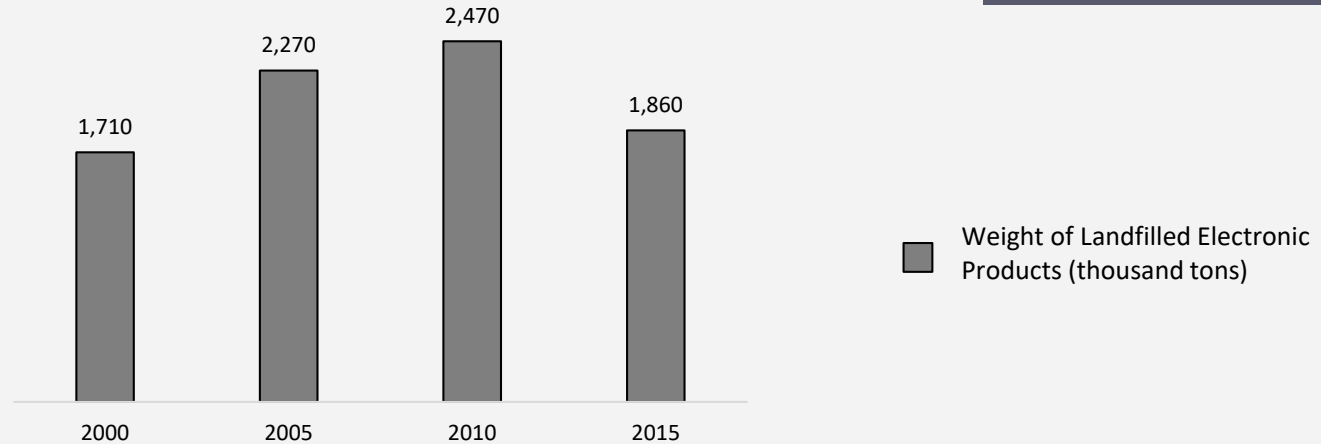
**Between 2000 and 2015, the quantity of electronic product recycling increased from 190,000 tons to 1,230,000 tons.**

*U.S. Environmental Protection Agency, 2018*





## Electronic Products Combusted with Energy Recovery or Landfilled



**Between 2000 and 2010, the weight of landfilled electronic products increased from 1.7 million to nearly 2.5 million tons, before declining to 1.9 million tons in 2015.**

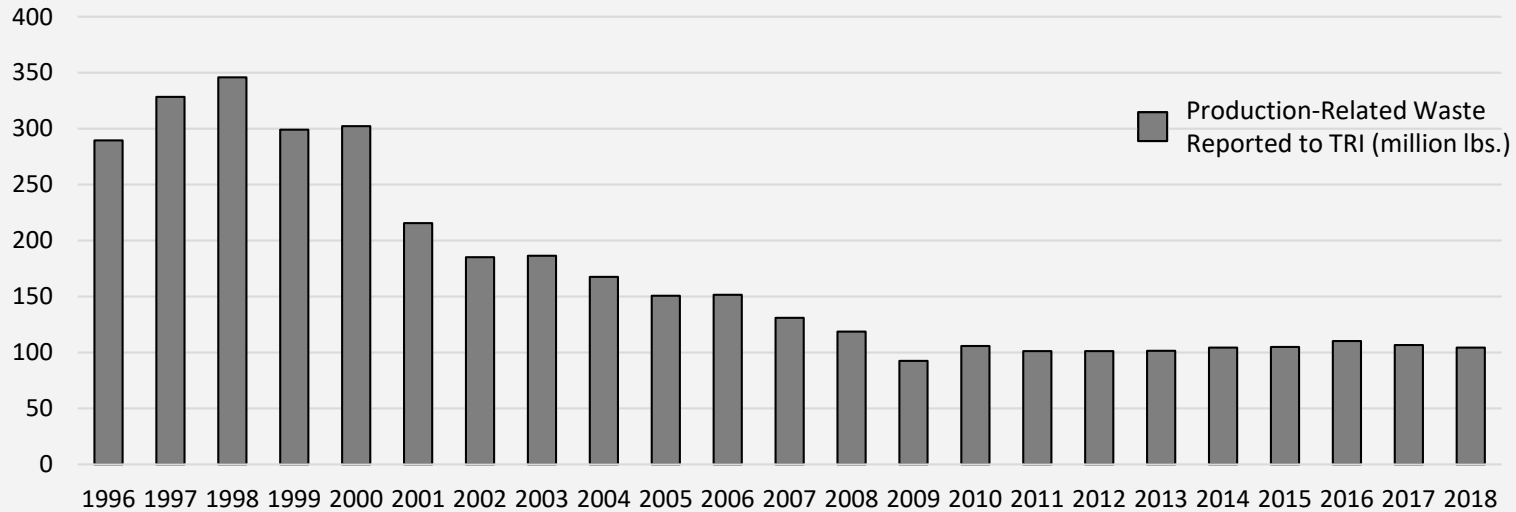
*U.S. Environmental Protection Agency, 2018*



# ELECTRONIC PRODUCTS & SEMICONDUCTOR MANUFACTURING



## Production-Related Waste from Electronic Products Manufacturing Reported to TRI



**Between 1996 and 2018, production-related waste reported to TRI by the electronic products manufacturing sector decreased from roughly 290 million to 104 million pounds.**

*U.S. EPA Toxics Release Inventory, 2020*

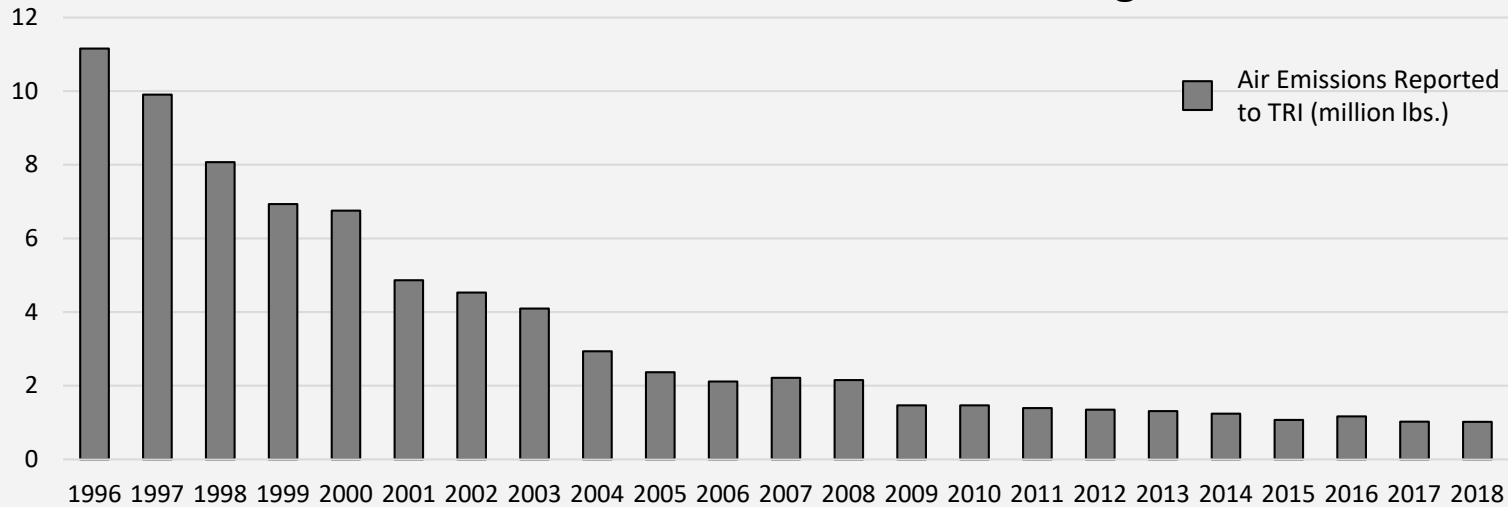




# ELECTRONIC PRODUCTS & SEMICONDUCTOR MANUFACTURING



## Air Emissions Reported to TRI from Electronic Products Manufacturing



**Between 1996 and 2018, air emissions reported to TRI by the electronic products manufacturing sector decreased from roughly 11 million to 1 million pounds.**

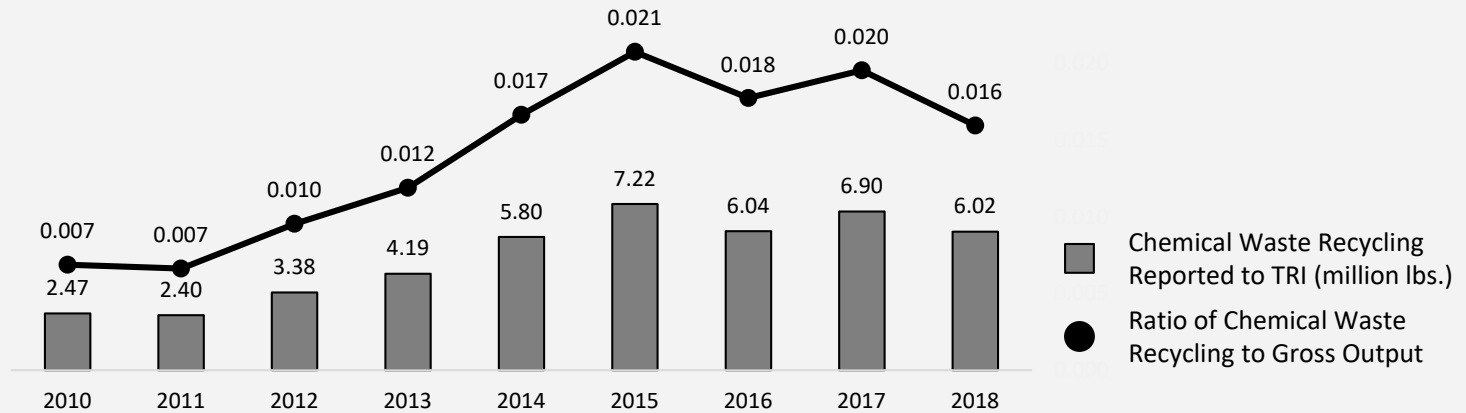
*U.S. EPA Toxics Release Inventory, 2020*



# ELECTRONIC PRODUCTS & SEMICONDUCTOR MANUFACTURING

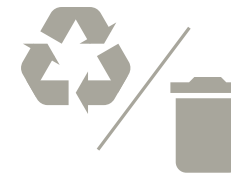
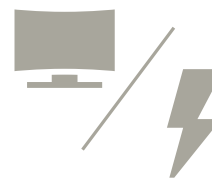
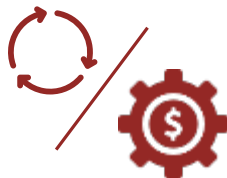


## Chemical Waste Recycling Reported to TRI vs. Gross Output



**Between 2010 and 2018, the ratio of chemical waste recycling reported to TRI vs. Gross Output increased from 0.007 to 0.016, constituting a 230% increase.**

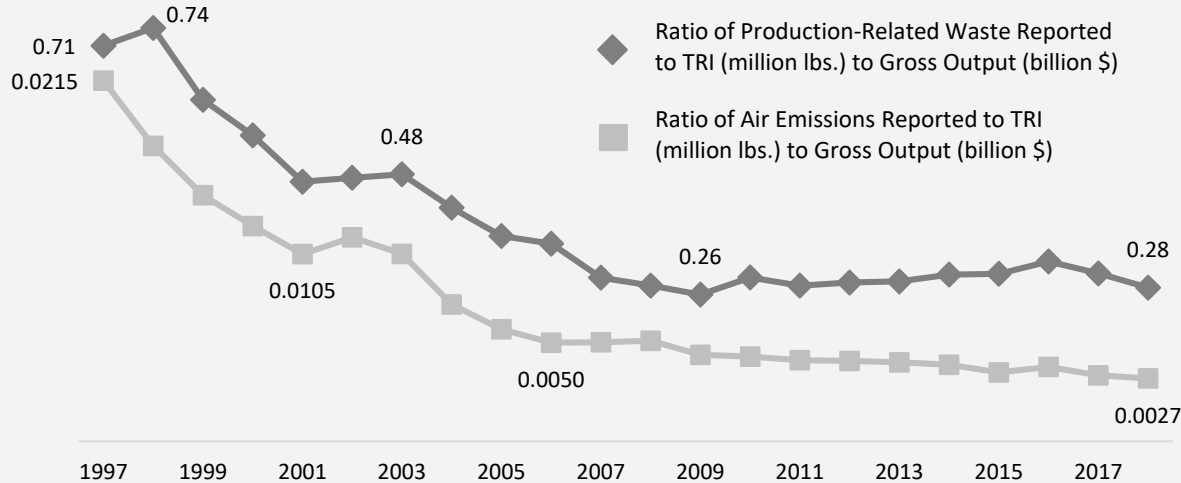
*EPA Toxics Release Inventory, 2019; Bureau of Economic Analysis, 2019*



# ELECTRONIC PRODUCTS & SEMICONDUCTOR MANUFACTURING

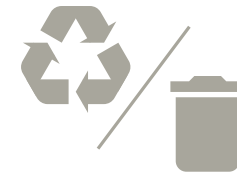
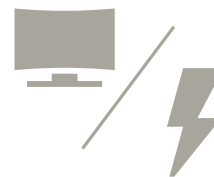
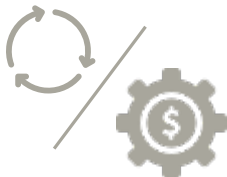


## Air Emissions and Production-Related Waste Reported to TRI vs. Gross Output



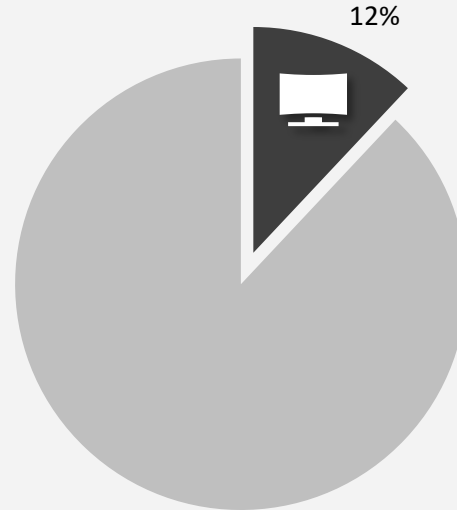
**Between 1997 and 2018, the ratio of production-related waste and air emissions reported to TRI to Gross Output declined by 61% and 87%, respectively.**

*EPA Toxics Release Inventory, 2019; Bureau of Economic Analysis, 2019*



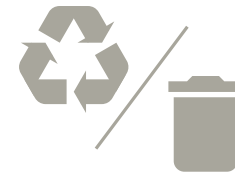
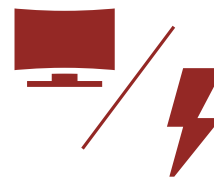
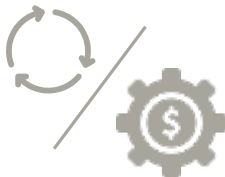


## Electronic Products Energy Consumption



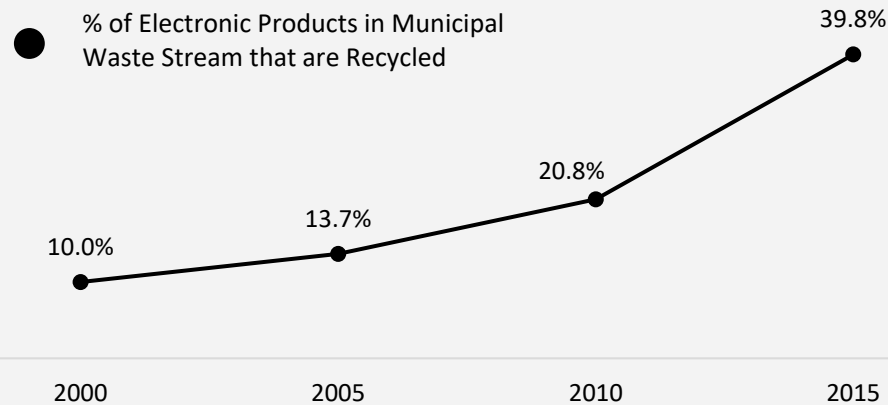
**The average U.S. household owns 24 consumer electronic products, which are responsible for 12% of household electricity use.**

*U.S. EPA, ENERGY STAR, 2020*



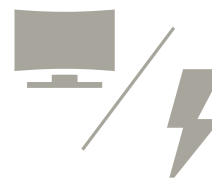
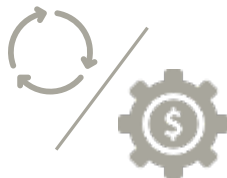


## Electronic Products Recycling



**Between 2000 and 2015, the percentage of electronic products that entered the municipal waste stream and were recycled increased from 10% to nearly 40%.**

*U.S. EPA, 2018*



# ELECTRONIC PRODUCTS & SEMICONDUCTOR MANUFACTURING



Broadly, the electronic products and semiconductor manufacturing sector includes computer and electronic product manufacturing (NAICS 334). Establishments in this sector manufacture a wide range of computing and communication equipment as well as smaller electronic device components such as semiconductors, circuit boards, capacitors, resistors, and coils.

Establishments in this sector range from companies engaged in the production of final consumer products and scientific instruments such as phones, computers, and medical devices to manufacturers of individual inputs such as silicon chips. Specifically, EPA data sources for electronic recycling include subsets of NAICS 334.

For more information about the EPA Smart Sectors program, visit: [epa.gov/smartsectors](https://epa.gov/smartsectors).

For more information about the electronic products and semiconductor manufacturing sector, visit:

- [U.S. EPA ENERGY STAR](#)
- [U.S. EPA Sustainable Materials Management](#)
- [U.S. EPA Facts and Figures about Materials, Waste and Recycling](#)
- [U.S. Bureau of Labor Statistics – Computer and Electronic Product Manufacturing](#)
- [U.S. Census Bureau, NAICS 334](#)