



Economic Impacts of PFAS in California

- **PFAS (Per- and Polyfluoroalkyl Substances)** are chemicals used in a wide variety of health, safety, and consumer applications.
- **Numerous industries in California use PFAS as vital inputs**, whether as an important component of a final product itself or as part of its production process.
- **These industries help support economic activity in addition to what is reported in the official statistics.** This additional economic activity, known as indirect (upstream supply chain) and induced (spending of disposable income by employees) impacts, is estimated using input-output analysis and IMPLAN, a widely used economic modeling system.

Key PFAS-Utilizing Industries



Aerospace



Batteries



Refrigeration, Air Conditioning, and Heat Pumps



Automotive



Medicine and Pharmaceuticals



Semiconductors

In total, the PFAS-utilizing industries analyzed help support over 500,000 jobs and contribute nearly \$150 billion to state GDP.

Economic Impacts

	Employment	Labor Income	GDP
Direct	141.8k	\$34.4B	\$94.3B
Indirect	158.4k	\$17.2B	\$27.1B
Induced	208.6k	\$15.2B	\$26.9B
Total	508.8k	\$66.8B	\$148.3B

Employment Multiplier

Each job in a PFAS-utilizing industry helps support 2.6 other jobs in the economy.

Share of State GDP

PFAS-utilizing industries, their supply chains, and induced impacts account for 4.4% of state GDP.



Economic Impacts of PFAS in California: Industry Focus



Aerospace - California's aerospace industry use PFAS compounds for maintaining airworthiness and safety performance of aircraft. PFAS help to prevent degradation, corrosion, leakage, and contamination that can otherwise require high levels of maintenance or lead to failures.

In total, the aerospace industry supports 108,500 jobs and contributes more than \$21 billion to the state economy.

	Employment	Labor Income	GDP
Direct	42.9k	\$7.4B	\$12.3B
Indirect	25.0k	\$2.6B	\$3.9B
Induced	40.7k	\$3.0B	\$5.3B
Total	108.5k	\$13.0B	\$21.4B



Automotive - The automotive industry depends on PFAS compounds to manufacture engine components and in-car electronics. Additionally, PFAS are implemented in some types of automotive safety technology (including driver assistance systems).

California's automotive industry helps support nearly 100,000 jobs and contributes more than \$18 billion to GDP.

	Employment	Labor Income	GDP
Direct	25.1k	\$4.5B	\$7.4B
Indirect	39.7k	\$3.8B	\$6.5B
Induced	33.5k	\$2.4B	\$4.3B
Total	98.4k	\$10.7B	\$18.3B



Batteries - PFAS compounds are used by manufacturers to produce a wide array of battery types due to their chemical, temperature, and oxidation resistance. The uses of batteries include a growing number of green energy applications, including solar energy storage and electric vehicle propulsion.

Battery manufacturers in California support 6,000 jobs and generate \$900 million in GDP.

	Employment	Labor Income	GDP
Direct	2.9k	\$0.4B	\$0.5B
Indirect	1.1k	\$0.1B	\$0.2B
Induced	1.9k	\$0.1B	\$0.2B
Total	6.0k	\$0.6B	\$0.9B



Medicine and Pharmaceuticals - PFAS compounds are used as active ingredients and as a resource to achieve purity in the manufacturing and research stages. They are also used in medical packaging applications which preserve the shelf life of life-saving products.

In total, the medicine and pharmaceutical industry supports 116,000 jobs and contributes nearly \$60 billion to the state economy.

	Employment	Labor Income	GDP
Direct	31.5k	\$6.6B	\$44.9B
Indirect	39.4k	\$4.6B	\$7.9B
Induced	45.2k	\$3.3B	\$5.8B
Total	116.2k	\$14.5B	\$58.6B



Refrigeration, Air Conditioning, and Heat Pumps - The refrigeration, air conditioning, and heat pump industry depends on PFAS to produce equipment which preserve perishable foods, protect the pharmaceutical cold chain, and support air conditioning systems of vehicles, homes, and industries.

California's refrigeration, air conditioning, and heat pump manufacturers support over 5,000 jobs and contribute \$800 million to state GDP.

	Employment	Labor Income	GDP
Direct	2.4k	\$0.2B	\$0.4B
Indirect	1.5k	\$0.1B	\$0.2B
Induced	1.4k	\$0.1B	\$0.2B
Total	5.2k	\$0.4B	\$0.8B



Semiconductors - California's semiconductor industry depends on PFAS compounds to manufacture revolutionary technologies that underpin our digital society.

When indirect and induced impacts are included, activity related to semiconductor manufacturing supports almost 175,000 jobs and contributes nearly \$50 billion to the state economy.

	Employment	Labor Income	GDP
Direct	36.9k	\$15.3B	\$28.8B
Indirect	51.7k	\$6.0B	\$8.4B
Induced	85.9k	\$6.3B	\$11.1B
Total	174.5k	\$27.5B	\$48.3B