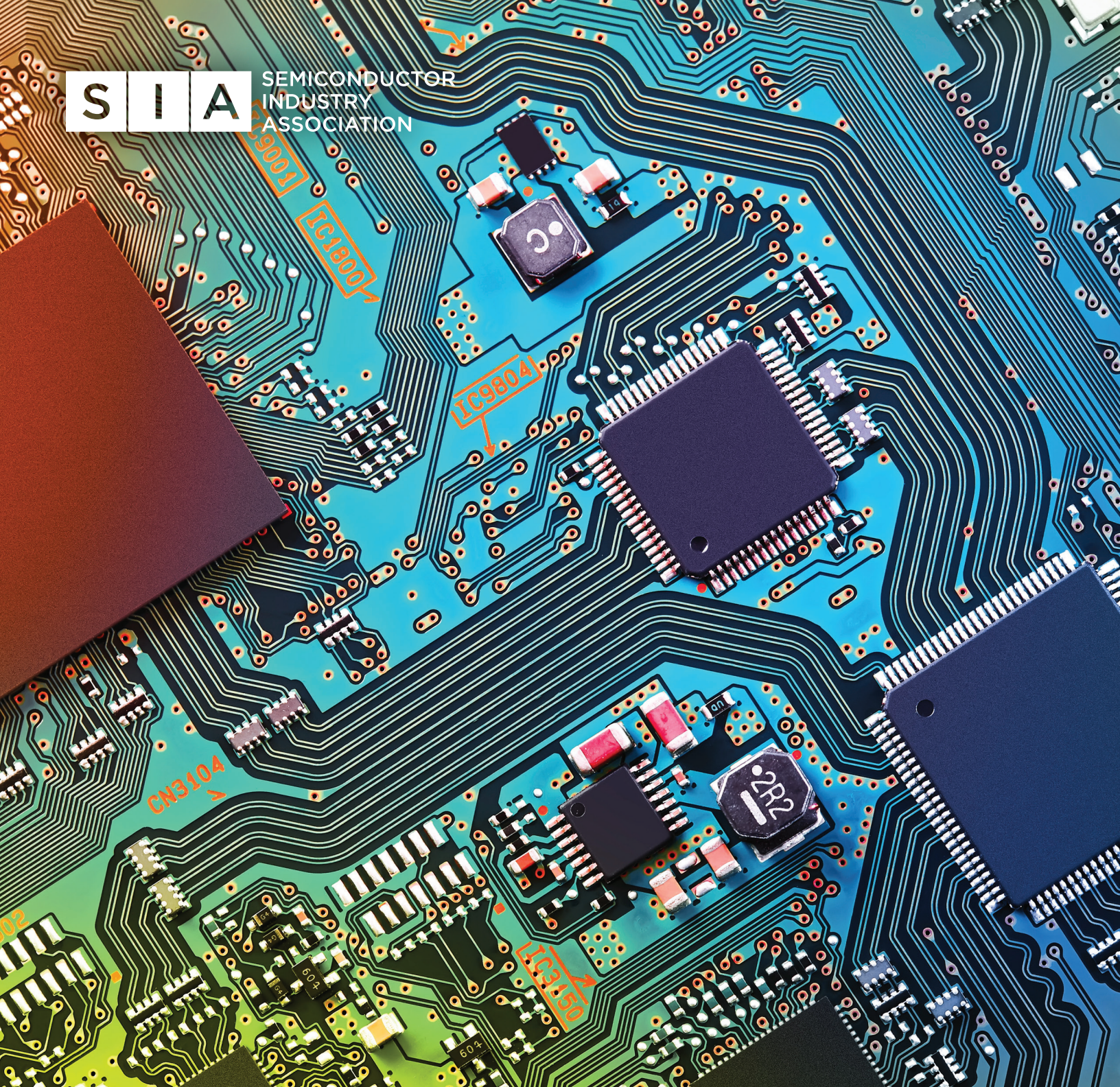




SEMICONDUCTOR
INDUSTRY
ASSOCIATION



U.S. SEMICONDUCTOR LEADERSHIP

A POLICY PLATFORM

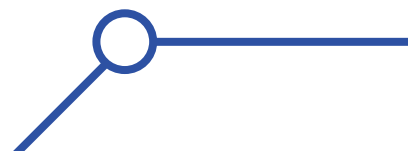
Fall 2020

**SEMICONDUCTORS –
THE BRAINS OF
ELECTRONIC DEVICES –
ARE ESSENTIAL TO
AMERICA'S ECONOMY,
JOB CREATION,
TECHNOLOGY
LEADERSHIP, AND
NATIONAL SECURITY.**



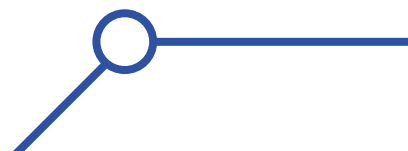
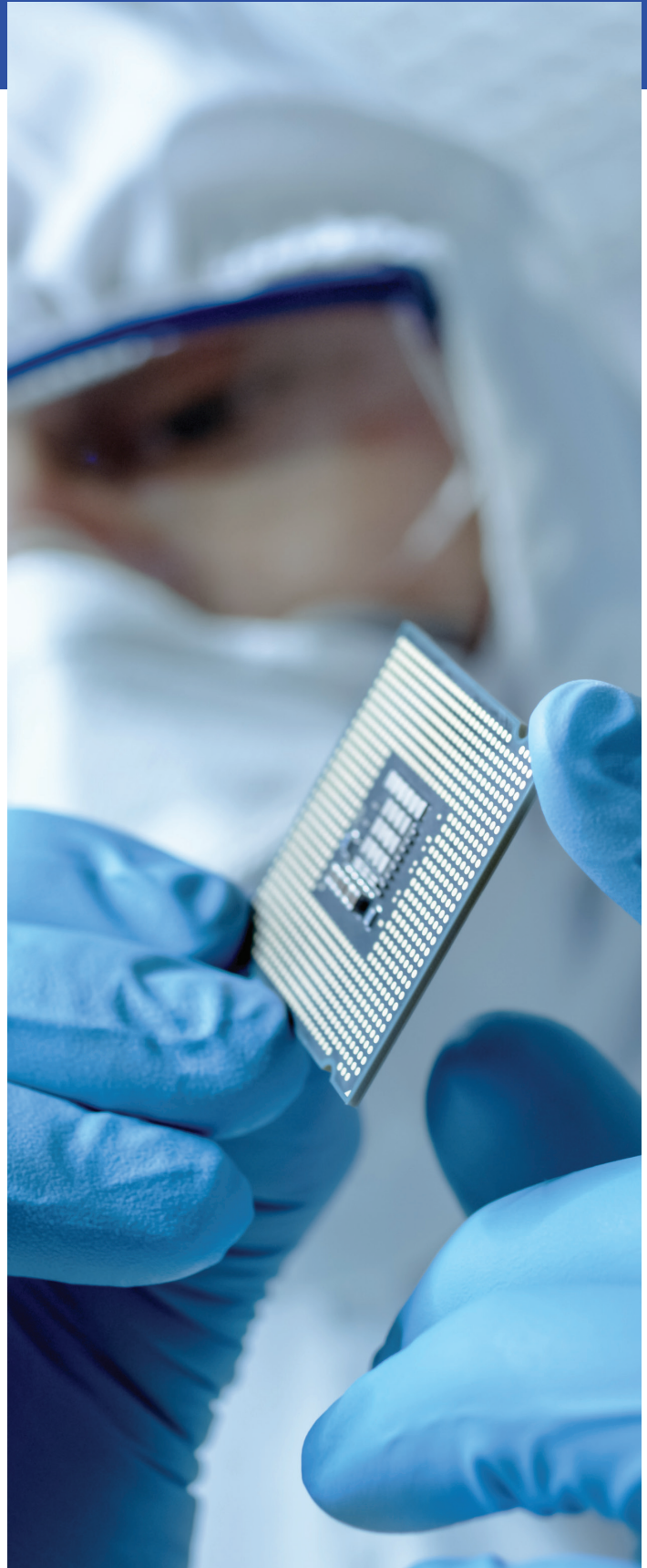
CONTENTS

- 4** INVEST IN U.S.
SEMICONDUCTOR LEADERSHIP
- 6** MAINTAIN ACCESS
TO GLOBAL MARKETS
- 8** POLICIES FOR U.S.
COMPETITIVENESS AND
TECHNOLOGY LEADERSHIP



Semiconductors have driven transformative advances in nearly every modern technology, from computers to mobile phones to the Internet itself. Chips also will underpin advances in the “must-win” technologies of the future, including artificial intelligence (AI), quantum computing, and advanced wireless networks (5G/6G).

Continued U.S. leadership in semiconductor technology is critical to our future. To preserve U.S. leadership and prevent the erosion of our innovation and manufacturing base, Congress and the administration must enact bold policies to help ensure America continues to lead the world in semiconductor research, design, and manufacturing.



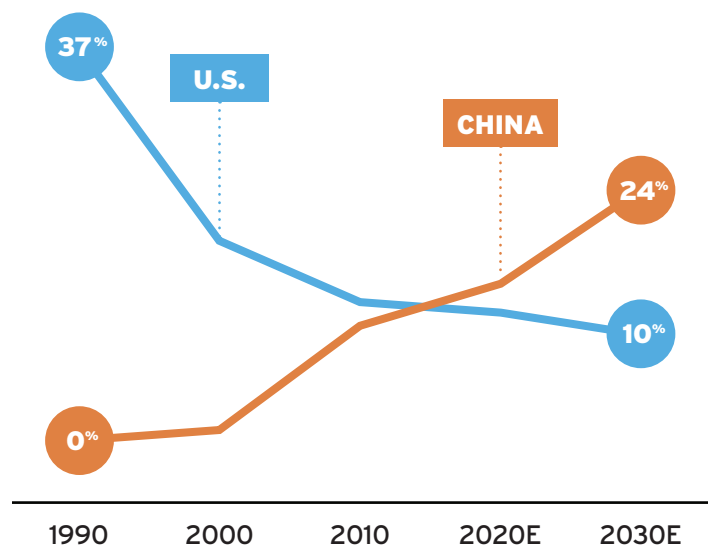
INVEST IN U.S. SEMICONDUCTOR LEADERSHIP

1 INCENTIVIZE U.S. SEMICONDUCTOR MANUFACTURING AND STRENGTHEN SUPPLY CHAINS

Given the strategic importance of the semiconductor industry and the need to make supply chains more resilient, it is crucial for the U.S. to maintain a robust manufacturing ecosystem – from research and design to fabrication and packaging. The U.S. now has only 12 percent of global semiconductor manufacturing capacity, a decline from 37 percent in 1990. The cost of building an advanced semiconductor fabrication facility in the U.S. is not competitive with other countries. The cost differential is directly attributable to significant subsidies provided by global competitors such as China to build their domestic capabilities, and the U.S. lacks comparable incentives. To spur economic growth and strengthen the resilience of the semiconductor supply chain to meet our national security and critical infrastructure needs, Congress should enact legislation to provide targeted grants and an investment tax credit to spur the construction of new onshore advanced semiconductor research, design, and manufacturing facilities.



Share of global semiconductor manufacturing, 1990-2030E.

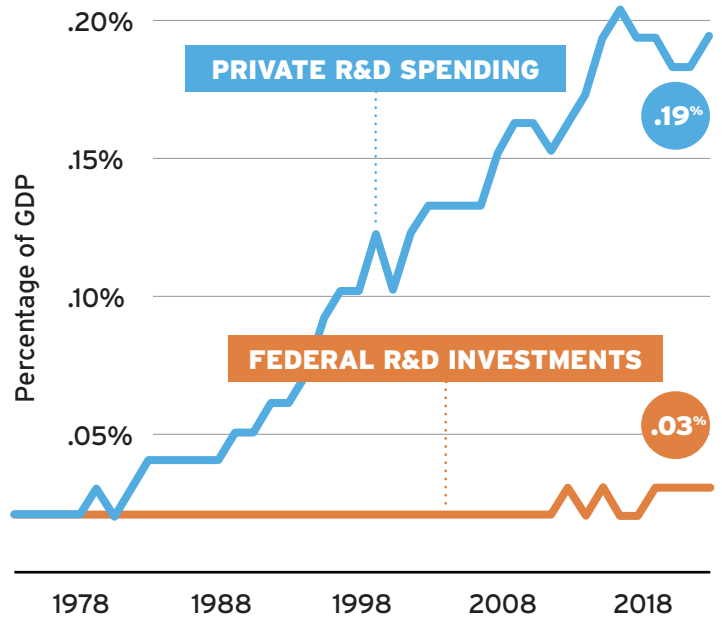


2 INVEST IN AMERICAN SEMICONDUCTOR TECHNOLOGY LEADERSHIP

U.S. semiconductor leadership is critical for America to lead the world in the race for the technologies of the future, such as AI, quantum computing, and 5G/6G. The U.S. semiconductor industry invests approximately one-fifth of its annual revenue into research and development, a higher share than almost any other industry, amounting to nearly \$40 billion in 2019. Federal investments in R&D, in contrast, have failed to keep pace with the rising costs of developing new technology, and global competitors, including China, are investing heavily to challenge U.S. leadership.

To maintain U.S. technology preeminence, Congress and the administration should triple federal funding for semiconductor research and double investments in semiconductor-related fields, such as electrical engineering, mathematics, materials, and computer science. These investments in both basic and applied research will help maintain U.S. technology leadership – and the economic and national security benefits resulting from such leadership – and provide the added benefit of training the skilled workforce of scientists and engineers needed to compete in the global marketplace.

Federal semiconductor research has remained flat, while private investment has increased 10-fold.



3 DEVELOP A HIGH-SKILLED WORKFORCE

America's lead in semiconductor technology rests on our ability to attract and retain the best scientists and engineers to push the boundaries of physics, chemistry, and advanced manufacturing. But the U.S. education system fails to generate a sufficient number of graduates in STEM fields, including women and underrepresented minorities, and is poorly aligned with the needs of our industry.

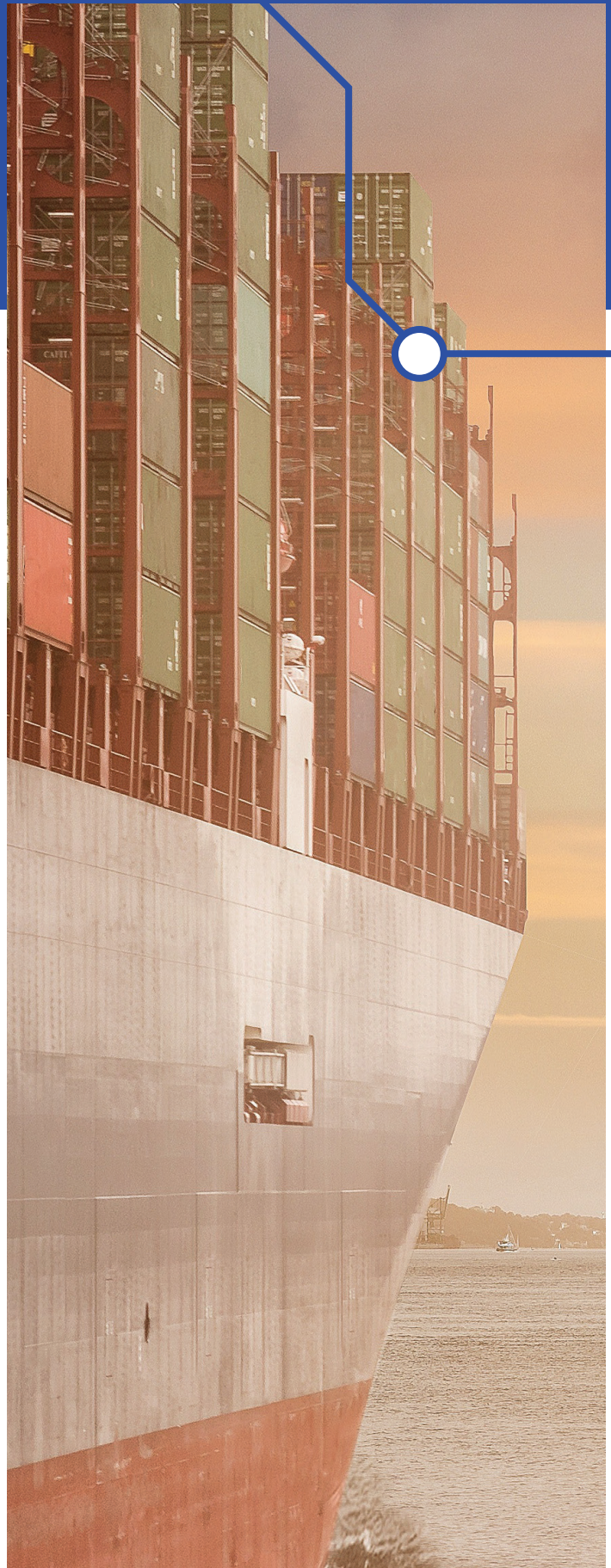
The U.S. must implement a national strategy – backed by appropriate investments and in consultation with education leaders and the private sector – to improve our educational system and increase the number of Americans graduating in STEM fields. Additionally, the U.S. must reform its high-skilled immigration system to enable access to, and retention of, the best and brightest in the world. Among other things, Congress and the administration should work to eliminate the existing green card backlog, end discriminatory per-country caps on green cards, and exempt advanced STEM degree graduates of U.S. universities from existing green card caps.

MAINTAIN ACCESS TO GLOBAL MARKETS

1 IMPLEMENT A STRATEGY FOR COMPETING WITH CHINA

China is both a competitor in the technology sector and global economic leadership and a geopolitical challenger to U.S. and its allies. At the same time, it is a major player in the global economy and a top customer for U.S. technology companies, including in the semiconductor industry. China is the location of much of the world's electronics supply chain and a high percentage of the products made by the customers of American chip firms are assembled in China, even if higher value research, design, and manufacturing is conducted elsewhere. As a result, proposals to completely “decouple” the two economies would inflict great harm on the U.S. semiconductor industry, our workforce, and the global economy as a whole.

The U.S. must meet the challenges posed by China's rise through smart and effective policies. First, government and industry in the U.S. must invest in our own competitiveness and improve our innovation base and human capital to accelerate U.S. technology leadership. Second, rather than unilateral efforts focused at slowing China's growth through trade and technology restrictions, the United States should work with our allies to adopt a strong, durable, and targeted multilateral regime to protect sensitive technologies, intellectual property, and the rule of law. Finally, America and its allies must ensure China respects global trade rules and provides access to its large and growing market on fair and reciprocal terms.

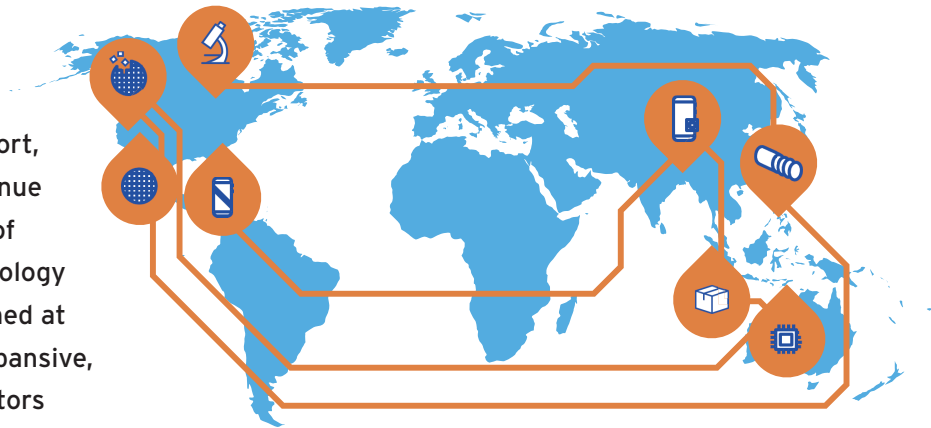


2 ENSURE EXPORT CONTROLS ARE NARROW, TARGETED, AND MULTILATERAL

Semiconductors are America's fifth-largest export, and the ability to sell globally provides the revenue and scale necessary to support the high levels of investment in R&D necessary to maintain technology leadership. Recent export control measures aimed at semiconductor technology have been overly expansive, covering non-sensitive commercial semiconductors and related technologies. In addition, these controls have been imposed in a unilateral manner. In the absence of coordinated action with our allies, these actions unintentionally undermine U.S. semiconductor leadership and risk compromising our military and intelligence advantage.

In order to advance our national security while maintaining our industrial competitiveness, export control policies should be: 1) narrowly targeted to specific items that advance clear national security and foreign policy objectives; 2) multilateral and coordinated with our allies; and 3) consider impacts on U.S. industry and technology leadership. Export controls failing to adhere to these principles are likely to harm U.S. competitiveness and the industrial base and be ineffective in achieving national security goals. While targeted and effective export controls are needed to protect sensitive technology, the best way to ensure continued U.S. leadership in critical technologies is through continued innovation and policies to establish a strong innovation ecosystem.

Global Semiconductor Value Chain Map



3 PROMOTE U.S. GLOBAL LEADERSHIP ON TRADE POLICY

More than 80 percent of sales of the semiconductor industry in the U.S. come from global markets. A key ingredient of U.S. success is our ability to leverage the global value chain. Accordingly, access to global markets and the free flow of commercial goods is essential to the continued leadership of the U.S. semiconductor industry and the health of our industrial base.

Congress and the administration should work to promote 21st century trade rules that remove market barriers, eliminate tariffs, protect intellectual property, and enable fair competition. Modernizing trade agreements, strengthening WTO trade rules, updating and renewing trade promotion authority and setting an ambitious trade agenda should be a priority for Congress and the administration.

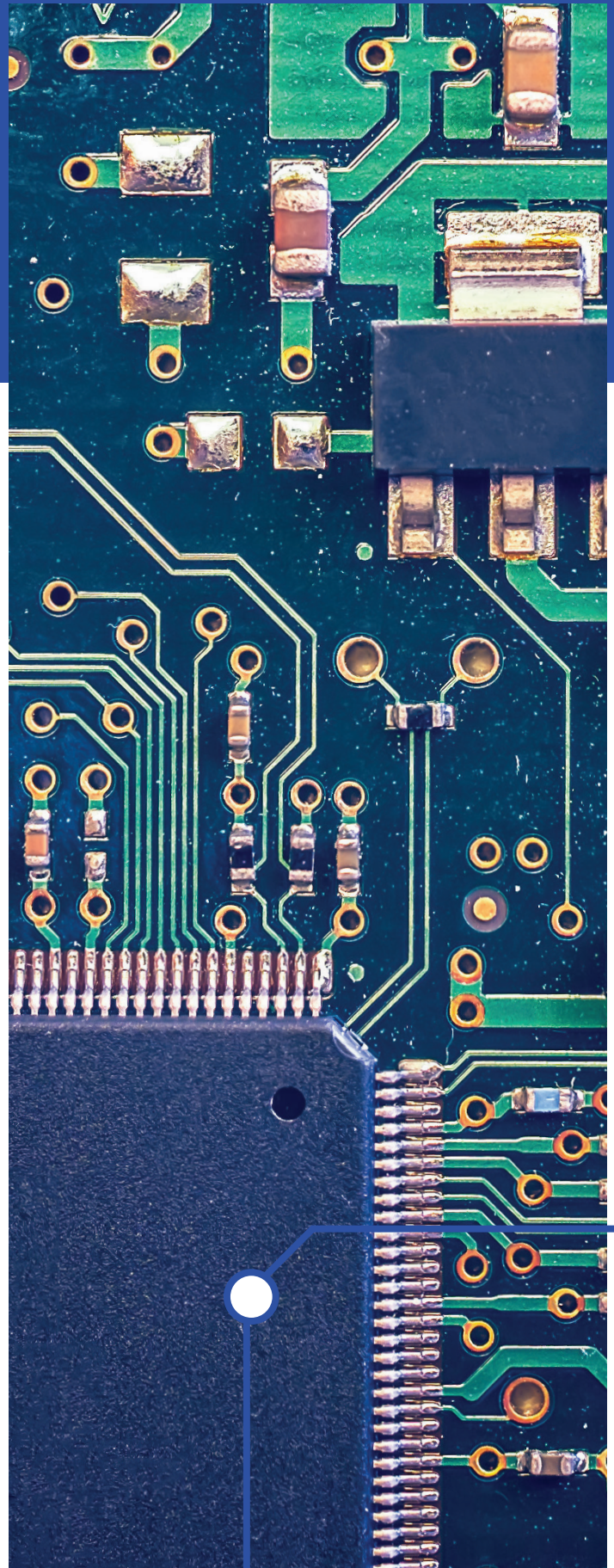
POLICIES FOR U.S. COMPETITIVENESS AND TECHNOLOGY LEADERSHIP

1 ADOPT A NATIONAL STRATEGY TO LEAD ON TECHNOLOGIES OF THE FUTURE

The U.S. should adopt, implement, and fund a coordinated, whole-of-government national strategy for leadership in the technologies of the future, including AI, quantum computing, 5G/6G, and others. These technologies - all enabled by semiconductors - will be critical to the future of the U.S. economy and national security, and it should be a national priority for the U.S. to win this global competition for technology leadership. Backed by sustained funding, this strategy should be developed jointly between the public and private sectors and include policies to strengthen our human capital in these fields and investments in research to advance U.S. technology leadership.

2 STRENGTHEN TAX POLICY TO PROMOTE GLOBAL COMPETITIVENESS

The U.S. must maintain a globally competitive tax structure that encourages investment and growth in the U.S. and ensures U.S. companies compete on a level playing field globally. Congress and the administration should work together to strengthen the existing R&D tax credit and incentivize domestic manufacturing, including adoption of an investment tax credit for new and expanded semiconductor fabrication and research facilities.



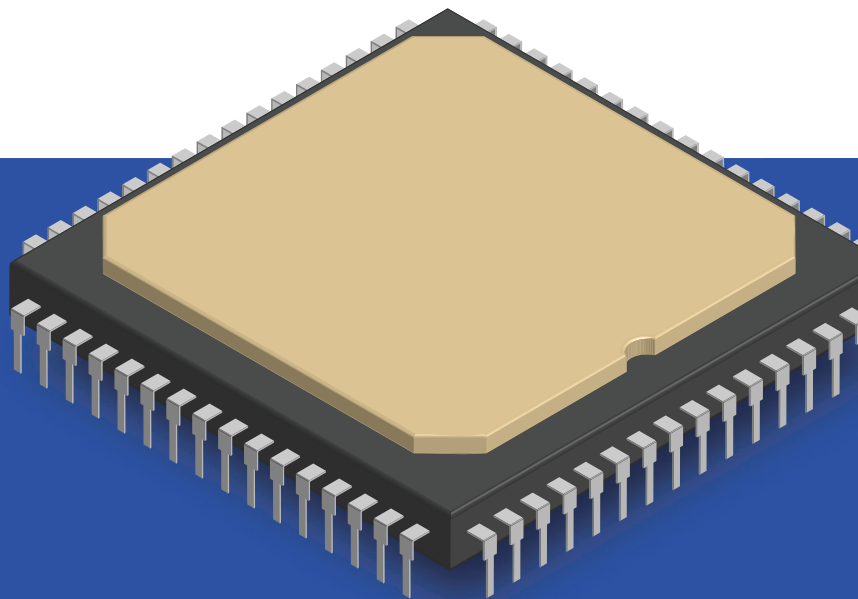
3 ENSURE CYBER AND SUPPLY CHAIN SECURITY

The U.S. should ensure policies to address cyber security and supply chain security are targeted at identifiable national security risks, thus avoiding overly broad policy responses that may have negative impacts on U.S. competitiveness, relationships with allies, and the government's ability to procure the most advanced commercial semiconductor and information and communications technology (ICT). The U.S. should also prioritize research in security and privacy, and future advances in ICT capability must accompany advances in security and privacy.

4 ADOPT ENVIRONMENTAL REGULATIONS THAT PROMOTE INNOVATION

Semiconductor manufacturing is a highly complex process requiring the use of sophisticated capital equipment working with chemicals and materials providing specialized functional properties needed to manufacture at the nanoscale. In many cases, these chemicals and materials have no feasible substitutes. The industry employs extensive and often redundant controls to manage these chemicals to reduce environmental releases and minimize human exposures. Environmental policies and regulations governing these chemicals should be designed to provide industry with certainty and the ability to innovate. Future climate policies should credit the actions of the semiconductor industry to date to reduce greenhouse gas emissions and provide for flexible, market-based implementation, while at the same time recognizing the positive role of semiconductor-enabled technologies in improving energy efficiency and reducing emissions throughout the economy.

The U.S. has led the world in semiconductor technology since the invention of the first integrated circuit six decades ago, and **smart policies can help enable our country to maintain leadership and innovation well into the future.**





SEMICONDUCTOR
INDUSTRY
ASSOCIATION