# BUILD THE SEMICONDUCTOR WORKFORCE OF THE FUTURE

# America's economic strength, national security, and technology leadership depends on a highly skilled technical workforce

A growing, globally competitive U.S. semiconductor industry requires a skilled workforce, including highly educated engineers and scientists, well-trained technicians, and others.

To ensure the success of the CHIPS Act - along with the national security and economic benefits derived from U.S. semiconductor leadership - America needs to adopt policies to educate and attract the top engineering and scientific talent in the world and train a skilled workforce for the semiconductor industry and other strategic technology sectors.

The U.S. semiconductor industry requires highly educated engineers and scientists to drive innovation in semiconductor technology, as well as skilled technicians. Approximately 60% of new manufacturing jobs in the semiconductor industry will not require a four-year college degree.

#### THE CHALLENGE

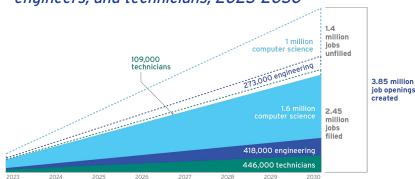
The U.S. has prioritized the competitive position of the domestic semiconductor industry, as well as other critical and emerging technology industries of strategic importance, but their success depends on an American workforce that is the best educated and trained in the world.

At current rates, the U.S. is expected to fall significantly short of the demand for skilled workers.

Failing to address this gap in skilled workers poses risks to the ability of the U.S. to compete in the global economy in manufacturing and chip design, our capacity for innovation and technology leadership, and ultimately our national security.

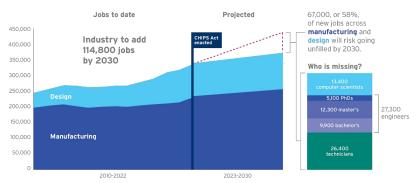
## 1. Economy-Wide Workforce Gap

Projected U.S. demand for computer scientists, engineers, and technicians, 2023-2030



# 2. Semiconductor Workforce Gap

Historical semiconductor workforce and projected 2023-2030 gap





# → THE SOLUTION

As companies implement programs to develop skilled workers and expand opportunities for underrepresented groups – including partnerships with states and localities, universities, community colleges, non-profits, labor organizations, veterans groups, and others – the U.S. should implement comprehensive workforce development policies to build the workforce of tomorrow needed to compete globally. Such policies should include the following:

#### Build the Supply of Engineers and Scientists

**Invest in the Innovation Workforce.** Congress should increase and sustain funding for federal research and development (R&D) programs at NSF, NIST, DOE, and DOD to train and build the pipeline of scientists and engineers needed to drive innovation in the semiconductor industry and other strategic technologies. To maintain U.S. technology leadership and meet our country's workforce needs, Congress should fund research programs to the levels authorized in the CHIPS and Science Act.

Attract and Retain High-skilled Global Talent. International students make up 60% of all advanced degree graduates at U.S. universities specializing in a semiconductor-relevant engineering or computer science field. Unfortunately, our immigration policies make it difficult for these foreign students to stay in the U.S. and contribute to our economic growth. As America builds its domestic pipeline of STEM workers in the long-run, policymakers should address the near-term needs of industry which can be solved by embracing immigration reforms targeted at bridging the gap in advanced degree STEM graduates necessary for U.S. semiconductor competitiveness.

### Improve and Simplify Training of Skilled Technicians

**High-quality workforce training.** To ensure the success of new semiconductor manufacturing projects, we need to expand high-quality workforce training programs. To capitalize on the opportunities of the CHIPS Act, we must ensure that the skills developed through workforce programs align with industry's needs. Policymakers should simplify and increase support for registered apprenticeships, as well as update and reauthorize WIOA and Perkins CTE.

**Standardization and Portability of Skills.** America's current workforce development system presents a complex web of programs that can be difficult for individuals and industry to navigate. To solve this problem, policymakers should seek out policies that help standardize training and curricula, create common measures of performance, recognize the transfer of credits and prior learning, and simplify career planning.

### Cross-Cutting Workforce Challenges - Expending the Pipeline and Addressing Affordability

**Expand and Advance the STEM Talent Pipeline**. Given the magnitude of the projected gap in workers across the supply chain, America needs a significant influx of workers to enter the STEM workforce and should accelerate those already in the pipeline. This is a massive effort that will require a partnership between the public and private sectors that raises awareness of careers in the semiconductor industry, engages and creates more opportunities for veterans, women, and underrepresented minorities in STEM, generates interest in the industry earlier in students' education, and boosts the number of advanced degree graduates that can immediately enter industry.

Affordability. If America is to meet the challenge ahead, it needs to embrace policies that increase participation in the STEM pipeline, including efforts to reduce financial barriers to students entering STEM programs. Anyone who wants to pursue a career in STEM should be able to, no matter the cost. Efforts to address these barriers must cross workforce and education programs, such as Pell grant eligibility for short term training programs, allowing individuals to pursue technician roles, and favorable loan terms to encourage individuals pursuing a four-year or advanced degree in engineering or computer science to continue their education.

