

The Skilled Technical Workforce: Crafting America's Science & Engineering Enterprise

The United States faces a **talent crisis** in science, technology, engineering, and mathematics (STEM) that threatens the nation's security, economic prosperity, and global prominence in science and engineering. This crisis is particularly acute in **critical** and **emerging** technology areas, where domestic STEM workers – those with U.S. person status, U.S. citizenship, or U.S. clearances – are required.

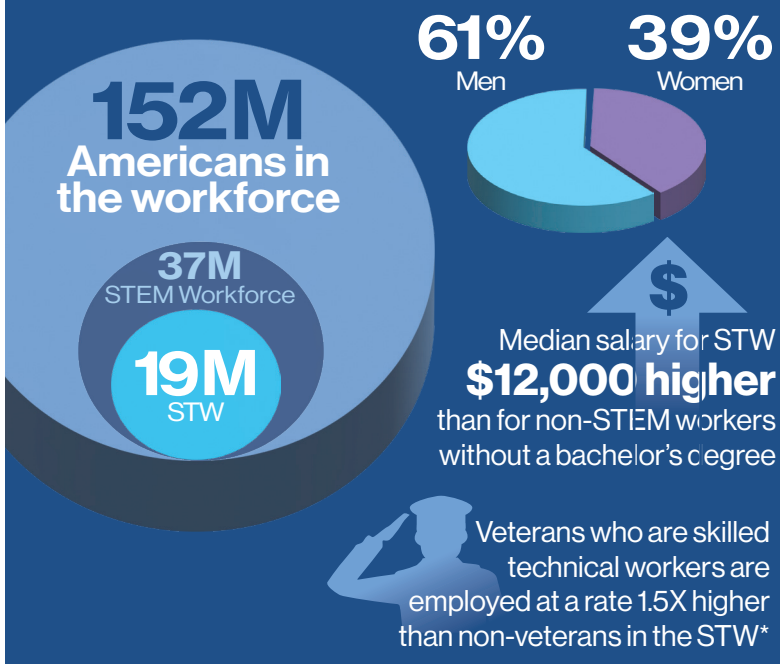
Growing the Skilled Technical Workforce (STW) is the quickest way to start addressing our nation's need for domestic STEM talent. Skilled technical workers – people who do not have a bachelor's degree – work in critical jobs that require science and engineering skills. U.S. factories, national labs, military, and government agencies need more skilled technical workers, from welders to electricians, computer programmers to laboratory technicians. Current vacancies threaten America's military readiness, domestic semiconductor manufacturing, automotive and aerospace industries, advanced manufacturing, cybersecurity, the bioeconomy, and health care. The STEM talent crisis also puts at risk whether next-generation manufacturing for these industries will happen in the United States. The STW is a key part of the U.S. innovation engine and we must quickly ramp up training, certification, and education of these workers.

NSB recommends:

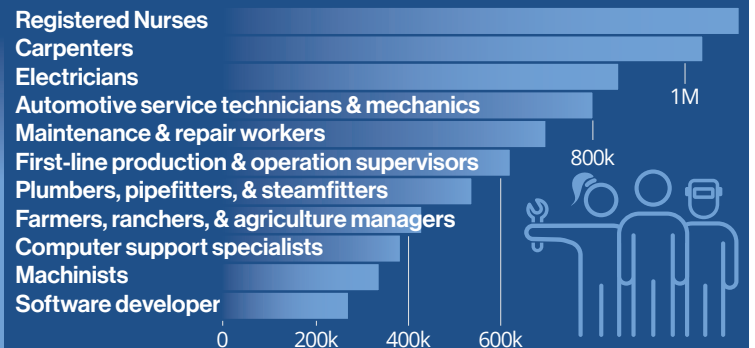
- **Rapidly grow STW training capacity – primarily at community colleges – through direct federal, state, local government, and private sector investments**
- **Maximize the impact of federal STW programs through strategic coordination**
- **Collect, analyze, and centralize data on STW careers, job openings, and anticipated workforce needs**
- **Better inform students, families, and career counselors about STW opportunities, including anticipated job growth and salaries**



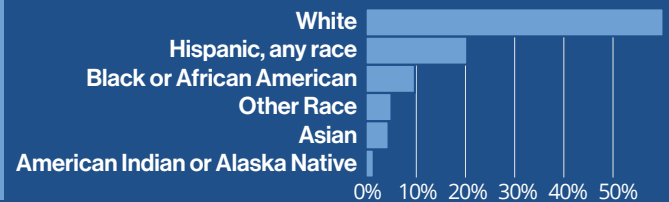
Skilled Technical Workers – Who are They and What do They do?



Skilled technical workers are essential in every sector

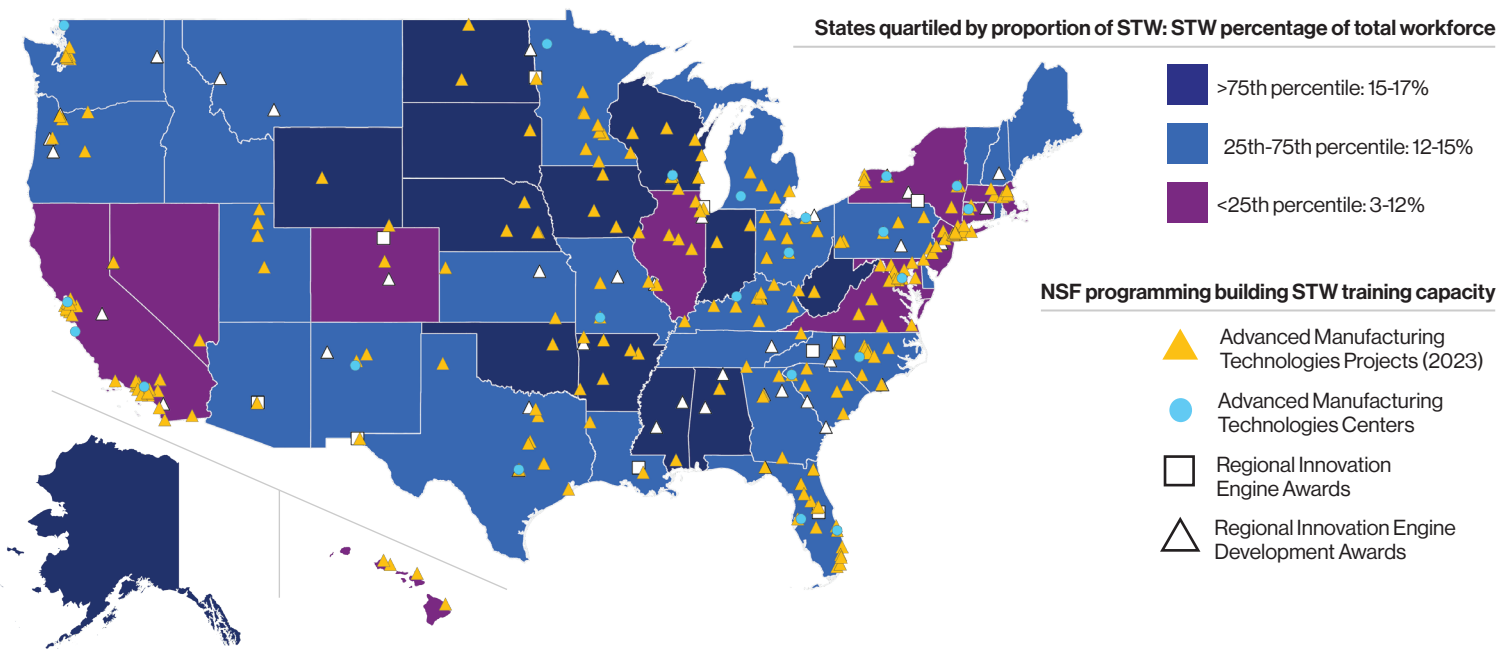


STW reflects U.S. racial and ethnic diversity better than other parts of the STEM workforce



* Rate derived from middle-skilled occupation data that are predominately comprised of skilled technical workers

The United States Can Leverage Current and Growing Infrastructure to Expand the STW

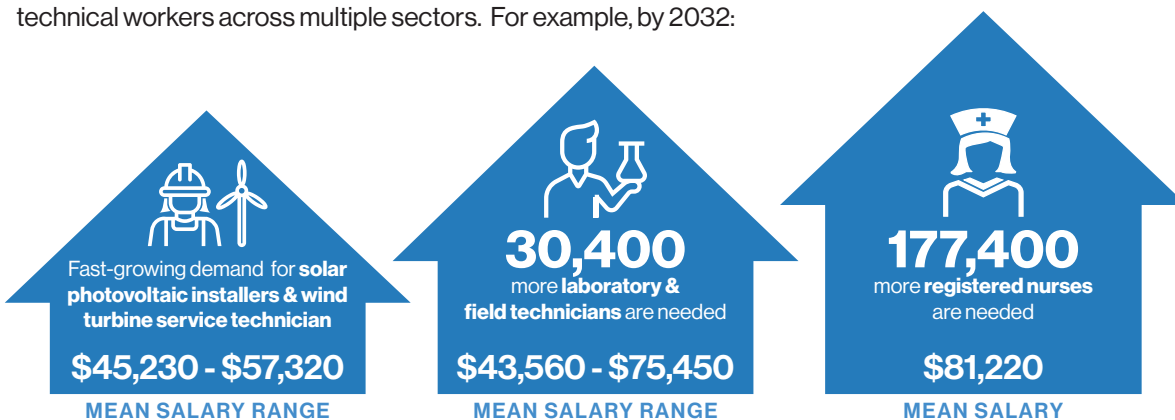


Innovation everywhere: The STW is a large fraction of the U.S. STEM workforce in every state, comprising 3% to 17% of the overall workforce. Quickly growing the STW in every state requires better communication about opportunities and bolstering STEM-degree granting community and technical colleges. These institutions, which fulfill educational and training requirements for certification and associate degree programs, are geographically and financially accessible. A coordinated federal strategy to build out their infrastructure – such as NSF’s Advanced Technical Education (ATE) and Regional Innovation Engines programs – in partnership with the private sector, will have the maximal impact in filling the nation’s STW needs.

2024 Indicators Labor Report; Advance Technical Education active awards; NSF Regional Innovation Engines

Many STEM-Dependent Sectors Signal Critical Need for More Skilled Technical Workers

Federal government projections show steady growth in a variety of jobs that can be filled by skilled technical workers across multiple sectors. For example, by 2032:



To meet anticipated market demand, STEM trade associations and industry organizations are independently assessing and sharing their current and projected needs for skilled technical workers.* These include:

- **2.1M U.S. Navy jobs**, especially **welders, metrologists, machinists, & non-destructive technicians**, needed by 2030. Median hourly pay: **\$30**
- **360,000 new welding professionals** needed by 2027. Mean salary: **\$47,540**
- **26,400 semiconductor technicians** needed by 2030
- **Thousands** of clean energy jobs – grid technologies and storage, traditional electricity transmission and distribution, nuclear energy, biofuels, and plug-in hybrid, battery electric, and hydrogen fuel cell vehicles and components

* December 2022 NSB panel "Addressing Workforce Shortages in Critical Technologies"; American Welding Society; Chipping Away: Assessing and Addressing the Labor Market Gap Facing the U.S. Semiconductor Industry (SIA, 2023)

