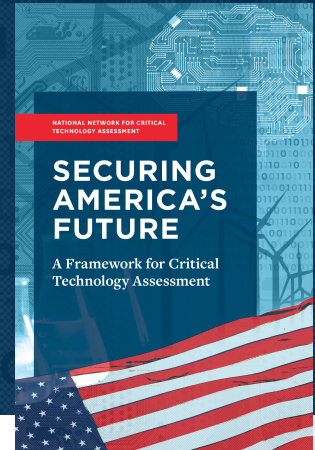# SECURING AMERICA'S FUTURE

A Framework for Critical Technology Assessment

Advanced analytics are essential to ensuring that the country smartly invests and enacts necessary policies to achieve short- and long-term security, prosperity, and broad-based societal well-being.

The CHIPS and Science Act introduced unprecedented legislation charging the White House Office of Science and Technology Policy with formulating a National Technology Strategy and the National Science Foundation's (NSF) Technology Innovation and Partnerships (TIP) Directorate to identify and evaluate societal, national, and geostrategic challenges facing the United States and investments in key technologies that could help address those challenges. To respond to this charge, the NSF TIP-funded National Network for Critical Technology Assessment brought together leading scholars from across the nation to demonstrate how advanced analytics can inform this challenge. Leaders from industry and government were involved throughout the analytic process.

KEY FINDINGS

GLOBAL COMPETITIVENESS

Novel measures suggest China has surpassed the U.S. in publications that are disruptive and create new fields.

ARTIFICIAL INTELLIGENCE

AI increases jobs (incl. non-AI) but distribution of benefits are limited. AI's potential to accelerate scientific discovery is also underutilized in multiple scientific fields.

BIOPHARMACEUTICALS

Supply chain vulnerabilities in generic drugs have the largest impact on public health, and face the largest barriers to introducing emerging technologies that might reduce these vulnerabilities. The barriers are regulatory and public awareness of quality issues.

SEMICONDUCTOR TECHNOLOGIES

U.S. academics have less fab access shuttle runs (MPWs) than international counterparts to commercialize emerging Semiconductor Technologies. Areas targeted for facilities have dramatically different skill readiness, and likely require programs tailored to those differences.

ENERGY STORAGE AND CRITICAL MINERALS

Battery supply chain vulnerabilities threaten to have economic impacts as large as the recent semiconductor shortage. These vulnerabilities could be largely ameliorated by increasing the supply of lithium and shifting to cobalt free batteries.

In *Securing America's Future,* the Network recommends that to have such analytics, the federal government will need to intentionally design a rapid Critical Technology Assessment function for Congress and the executive branch alike. This entity will need to function as an "analytic ARPA," marshaling the country's rich analytic capacity across disciplines and institutions to link technology investments and policy to the country's multiple missions.

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