

# HUGE SCIENCE-FUNDING BILL PASSES US SENATE WITH CHINA FOCUS

Scientists praise the legislation, but worry that it could dampen international collaborations.

By Ariana Remmel

The US Senate has voted overwhelmingly in favour of legislation that invests in the US National Science Foundation (NSF). But the bill, once aimed largely at helping the United States to maintain its status as a global leader through direct funding for research and development, now includes amendments aimed at preventing China from stealing or benefiting from US intellectual property – a development that scientists fear could threaten international collaborations.

In another major revision, Senate advocates for other US science agencies, such as the Department of Energy (DOE), have chipped away at the funding allocation originally intended for the NSF, arguing that they also deserve some of the money.

But if the legislation passes the US House of Representatives, the NSF could still see a doubling of its budget over five years. Given the agency's large role in funding basic research, science-policy researchers are praising this outcome. Although they have concerns, researchers agree that an investment of this size is long overdue: funding of US scientific research has not kept pace with the nation's economic growth.

"Even if it weren't for the competition with China, the American people deserve the benefits that come from these kinds of investments of taxpayer money," says Neal Lane, a science-policy researcher with the Baker Institute for Public Policy at Rice University in Houston, Texas, who is a former NSF director.

The bill "will jump-start American competitiveness, and make one of the most significant government investments in American innovation and manufacturing in generations", said Senate majority leader Chuck Schumer, who co-sponsored the legislation, which passed on 8 June.

The legislation began in 2020 as the Endless Frontier Act (EFA), which proposed investing US\$100 billion to create a technology directorate at the NSF, an agency that funds almost one-quarter of all federally backed basic research at US universities. The directorate would act as a hub for translating fundamental scientific discoveries into commercial technologies.

Because the NSF's budget had risen only



Senator Chuck Schumer has championed the Innovation and Competition Act.

incrementally since the agency's inception 70 years ago, many researchers and policy experts were elated to see renewed interest. But the focus on the NSF was quickly overshadowed during debates in Congress, when Senate advocates for other science agencies, such as the DOE, began vying for a slice of the multibillion-dollar pie. At the same time, US lawmakers

**"The American people deserve the benefits that come from these kinds of investments."**

questioned whether the bill included adequate security measures to protect against espionage from global competitors, such as China.

Eventually, the Senate incorporated a revised version of the EFA into a much larger legislative package called the US Innovation and Competition Act (I&CA), which includes the provisions that curtail – and increase scrutiny of – Chinese involvement in government-funded research. The EFA now authorizes a \$120-billion cash infusion to multiple US science agencies. The NSF would receive \$81 billion of that amount over 5 years; 36% of that would be designated for the technology directorate.

Some are disheartened by the downsizing of

the investment in a technology directorate. But others who had worried that an intense focus on the directorate would give short shrift to basic research see advantages. For instance, Lane says the decreased allocation for the directorate gives the agency more discretion and flexibility to fund projects that could lead to innovative technologies through both basic science and applied-research initiatives.

## Staying competitive

Increased funding to the NSF is an important investment for the United States, especially as China continues its own strong investment in research and development, says Lane. China now awards more bachelor's degrees in science and engineering than do the United States, the European Union and Japan combined.

But lawmakers reviewing the EFA say that a huge boost in funding for the NSF might end up benefiting China, too – and this concerns them. Over the past few years, the United States and countries such as Australia have taken steps to safeguard technology and intellectual property that has been developed through international collaborations with China. The actions have come partly in response to cases of alleged intellectual-property theft and concern regarding Chinese President Xi Jinping's 'military-civil' fusion strategy, which aims to co-opt university research in China for military use.

"I don't want the taxpayer funds to go in the front door and then to have the research go out the back door to China or other adversaries," said Senator Rob Portman, a ranking member of the Senate Committee on Homeland Security and Governmental Affairs, in a Senate floor proceeding.

Many university officials support the funding increase for US science, but they're keeping a close eye on provisions in the legislation aimed at curbing foreign influence on research. This includes a ban on federally funded researchers participating in foreign talent-recruitment programmes, such as China's Thousand Talents Plan, which recruits researchers to share their expertise and knowledge.

Multiple congressional investigations have highlighted the need for increased research security. But Denis Simon, executive director of the Center for Innovation Policy at Duke University School of Law in Durham, North Carolina, cautions that being too reactive to China's strategies could distract legislators from setting their own agenda for the future of US research. The United States is at the forefront of international efforts to tackle global challenges – including climate change and the COVID-19 pandemic – and it is to the country's benefit to collaborate with international partners such as China to find sustainable solutions, he says.

Still, a long road lies ahead before the I&CA might become law, including reconciliation proceedings with similar legislation proposed in the House of Representatives.