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Guest opinion: Rochester primed to build industry cluster in semiconductor chip packaging

By: Special to the RBJ Paul Ballentine September 16, 2022



Ballentine

Semiconductors lie at the heart of all electronics. They are an essential part of our daily lives, our nation's defense, and the global economy. The U.S. semiconductor industry has received more attention with the passage of the CHIPS + Science Act, which was led by Senator Schumer, strongly supported by Rep. Morelle, and signed into law by President Biden. In addition, Governor Hochul recently signed first-in-the-nation Green CHIPS legislation sponsored by state Senator Cooney.

Semiconductor manufacturing in the U.S. has fallen from 37% of global output in 1990 to just 12% today. More recently there has been a worldwide chip shortage, disrupting supply chains in everything from automobiles to appliances and medical equipment.

The CHIPS Act will bolster U.S. chip manufacturing and protect the nation from being overly reliant on foreign production. It provides \$52 billion in support for the industry, with \$39 billion in direct support for companies

building manufacturing plants in the U.S. and another \$11 billion for R&D.

New York has been making a strategic push to expand semiconductor manufacturing in the state for decades. It's an economic priority that continues to grow stronger. For example, the state has funded the development of the nanotechnology complex in Albany and incentivized semiconductor manufacturers GlobalFoundries and Wolfspeed to build plants in Upstate New York. Importantly, through NYSTAR, Empire State Development's Division of Science, Technology and Innovation, the state invests millions of dollars into semiconductor research and development.

Sen. Cooney's Green CHIPS bill will enable up to \$500 million annually in state tax credits for chip companies that build factories in the state with a focus on reducing carbon emissions. Companies would need to create at least 500 net new jobs and spend at least \$3 billion in capital investments over 10 years.

Fabrication of integrated circuits (ICs) themselves, such as what takes place in the GlobalFoundries plant in Malta, is only part of the process for complete semiconductor devices. To be used, the IC must be packaged which protects the fragile IC from damage, provides sufficient heat transfer to keep the IC from overheating, and connects the IC to the outside world, normally a printed circuit board. The situation for the U.S. semiconductor packaging industry is even more problematic than chip manufacturing.

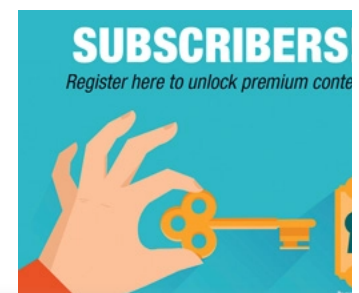
The U.S. began offshoring most of its packaging decades ago and now only does 3% of global packaging with nearly all the rest done in Asia. Recognizing this, the CHIPS Act provides substantial support for the U.S. packaging industry. Companies building packaging facilities in the U.S. will be eligible for incentives, and the Act sets aside more than \$2.5 billion for packaging R&D through the National Advanced Packaging Manufacturing Program (NAPMP). The program will establish "Hubs" around the country, forming private/public partnerships to develop new packaging technologies and provide access to advanced

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ample supply of water, stable and affordable power, industrial parks, and other physical infrastructure.

The NYSTAR-backed Center for Emerging & Innovative Science (CEIS) at the University of Rochester has been working with multiple partners throughout the region on two fronts. One is to position Rochester to be the home of a NAPMP Hub which would leverage the TAP facility as well as our universities and other regional assets.

The other is to encourage the growth of a semiconductor packaging cluster by incubating, growing, and attracting companies in the industry. Our regional economic development organization, Greater Rochester Enterprise (GRE), is leading the effort to attract packaging companies, leveraging the \$39 billion CHIPS Incentives program. Our efforts have been paying off. We hired the world's leading expert on the semiconductor packaging market. They have already introduced GRE to several packaging companies considering plants in the U.S. We have been hard at work bringing together community stakeholders to apply for one of the NAPMP Hubs.

With the strong commitment of New York to expand semiconductor manufacturing and the comprehensive and coordinated effort on the part of the Rochester region to build a packaging cluster and establish a federally funded packaging research center, the region is poised to become the center of semiconductor packaging in the U.S.

Paul Ballentine is Executive Director, Business Development for the University of Rochester's Center for Emerging & Innovative Sciences (CEIS)

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