The issues

- Can we limit the evolution of the semiconductor industry in China indefinitely?
- What is economic impact of export restriction?
- For design software, how may China respond?
- What the Chips Act need to support and why?



Economic Impact Examples

China is currently the world's largest semiconductor market in terms of consumption. In 2020, China represented 53.7% of worldwide chip sales, or \$239.45 billion out of \$446.1 billion. However, a large percentage are imported from multinational suppliers. (BNPparibas)

- For Intel, China is both a major marketplace and place of business: In 2022, the company employed more than 12,000 people there, and made more than \$17 billion in revenue, about 27 percent of its global total. (Nytimes)
- China accounts for 20% to 25% of Nvidia's revenue in its data center business, its biggest unit.(CNBC)
- Arm's sales in China contributed 24.5% of its \$2.68 billion revenue in fiscal 2023 (Reuters)



Electronic Design Automation in China

- Software piracy is rampant. Half or more of EDA software in China is pirated.
- Current count of China EDA companies is ~125...estimating 70 are credible to varying degrees. A handful are becoming quite significant including Huada Empyrean, Huawei's internal efforts, Primarius, etc.
- Three are now public and valuations have been decreasing of late as revenues versus expenses are out of line.
- Huawei appears to be an arbiter of whether a China EDA company can be judged as viable.
- EDA companies developed Export version of their tools excluding latest technology (supporting Gate-All-Around FET)



HOW WILL THE U.S. OVERCOME THE SEMICONDUCTOR SKILLED LABOR SHORTAGE?

Posted on April 27, 2022 by Jack Trompert



Job postings for electrical engineers in the U.S. semiconductor industry grew 78% from 2020 to 2021 — more than three times faster than growth for electrical engineers overall. What's more, the U.S. semiconductor industry will need between 70,000 and 90,000 new workers by 2025 to meet the most critical workforce needs, <u>reported</u> <u>Eightfold.ai</u>.

Tech talent shortage slows reshoring of chip manufacturing in US

Even as leading semiconductor manufacturers eye plans to build new fabrication facilities in the US, creating tens of thousands of new jobs, the lack of available tech talent threatens to stymie efforts.

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Senior Reporter, Computerworld | JUL 5, 2022 3:00 AM PDT

South China Morning Post

China chip makers scramble for semiconductor talent, showering fresh graduates with offers as peers in other fields face dim prospects

Courtesy: J. Rabaey



The Challenge



Raja Koduri Executive Vice President, Accelerated Computing Systems and Graphics (AXG) BU Intel Corporation



Source: US Dept of Education, IPEDS (https://nces.ed.gov/ipeds)



TESLA FSD SoC (36.8 teraOps, 260mm², 6Billion Tr)





- NoC Network on chip
- ISP Image Signal processing
- Safety Sys Lock step for ISO26262
- Security only TESLA certified software

Chip focused on Automotive L5 use case for Deep learning

