

Bad Developments for US Chip-making Dreams

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Biden has big dreams for the US industry – and Congress buys into it with billions in subsidies for new chip fabs (factories).

But looking at INTEL corporation, what remains of existing US chip-making is not doing well - to put it mildly:

- revenue down by a third (31%),
- loss \$ 7 billion, up by nearly 2 billion.

The remaining US chip production at INTEL is being outcompeted, wiped off, like the rest of US chip production was before it.

Intel Discloses \$7 Billion Operating Loss for Chip-making Unit

Intel said the manufacturing unit had \$7 billion in operating losses for 2023, a steeper loss than the \$5.2 billion in operating losses the year before. The unit had revenue of \$18.9 billion for 2023, down 31% from \$27.49 billion the year before. (Stephen Nellis and Max A. Cherney, Reuters, April 3, 2024)

Now, the competition (TSMC) is supposed to run the planned new US chip fabs, which are much touted by Biden and Congress. But the new US chip fabs are already marred by construction cost overruns and an acute shortage of workers with enough skills. There are also severe problems with differences between US work culture and TSMC. TSMC will prioritize and protect their main setup on Taiwan. And the world's biggest market for TSMC chips as well as for chips overall is not the USA but ... China.

The guestion arises, how will the two new TSMC fabs in Arizona fare?

Will the US military-industrial-complex be a big enough customer to fill them up?

TSMC seems already in doubt about that and hedges its bet by delaying its second chip fab in Arizona. TSMC explains its decision to delay the second of its two planned chip factory in Arizona appears between the lines from statements by TSMC's chairman Mark Liu:

Executive Chairman Mark Liu noted that the type of chips produced at the second fab would be determined in part by the types of federal incentives available, as well as market demand. (Joelle Anselmo, <u>Manufacturing Dive</u>, January 19, 2024)

From Mark Liu talks about "types of chips" it is obvious that TSMC sees no pent-up demand in the USA for the extra amount of chips they could produce in a second Arizona factory. Clearly, what Mark Liu and TSMC are *actually* concerned about is whether there will be strong enough demand in the US *at all* for the super advanced chips planned for TSMC's two new Arizona plants.

The thing is that the vast majority of the most advanced chips is not for military application, so although US strategic concerns are key to the US obsession with chips, the US military or its industrial suppliers will hardly be the biggest purchasers of the very expensive and advanced chips planned for TSMC's production in the US.

The US Department of Energy (with US defense) uses the most advanced types of chips for their super computers to run simulations of the detonation of new nuclear weapons. But most military hardware runs on chips with "standard-complexity", not the most advanced (small) ones. With only a (relatively) limited number of super computers, the US defense is not a big customer driving the demand for the most advanced chips.

Demand for the vast majority of the most advanced chips is driven by civilian use. For cell phones (in particular Apple iPhones) and commercially-run Al cloud computer centers which serve the public, the business community at large, and civilian government needs. It is hard to believe that Apple for its iPhone or Microsoft, IBM, Amazon, Oracle, and the other big corporations running gigantic Al cloud computers will buy US-made chips if they can get the same (or better) chips cheaper from Taiwan – at least not without additional US government compensation.

Why should TSMC build and fill up a costly second chip fab in the US if they have extra capacity on Taiwan and can build the same (or even better) chips cheaper on Taiwan?

After all, Taiwan will remain the home-base and center of knowledge, capacity, and excellence for TSMC. Therefore, it is logical that TSMC delays its second planned chip fab in the US. In the end, it boils down to whether the Al boom (or bubble?) will be strong enough to keep new advanced US chip fabs afloat – and TSMC seems to find that doubtful. US made chips (at higher costs and lower skills) may be the last to be bought ... and the first to go as chip demands fluctuate.

Put shortly, the demand for expensive US-made advanced chips insecure, and the sad experience of the past decades of US chip-making history may sadly repeat itself, as US chip fabs may be the first in the World to close in case of global over-supply outside China of advanced chips.

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