

Semiconductor chip  
demand is skyrocketing.

Are you ready?

[se.com/semiconductor](https://se.com/semiconductor)

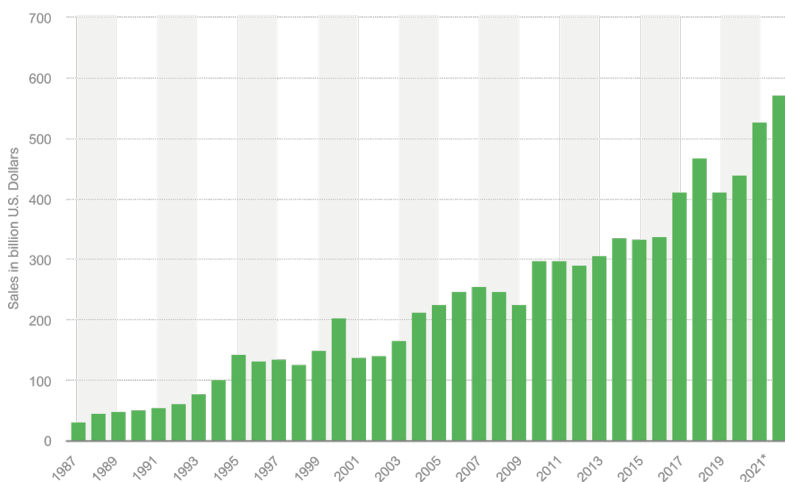
Life Is On

**Schneider**  
Electric



# Semiconductor manufacturers must increase capacity to meet booming demand

Semiconductors power the digital revolution. They are critical components for nearly all modern devices – from cell phones to cars to pacemakers. This dependence on semiconductors mean the global chip shortage has hobbled production for numerous industries. Semiconductor manufacturers need to increase their manufacturing capacity immediately to catch up with the market demand and prepare for upcoming needs.



(<https://www.statista.com/statistics/266973/global-semiconductor-sales-since-1988/>)

<https://www.idc.com/getdoc.jsp?containerId=prAP48247621>

“There are more than 100 billion integrated circuits [semiconductors] in daily use around the world—that’s equal to the number of stars in our corner of the Milky Way galaxy,”

- Semiconductor Industry Association (SIA)

It’s estimated that due to the shortage, in 2021 the global auto industry will have produced **4 million fewer vehicles** than planned and **lost \$110 billion in sales**.

Source: AlixPartners

## What is the most pressing concern?



How do I improve chips’ time to market?

By using the relevant advanced digital tools during the design and build phase and with the support from experts, new manufacturing fabs design can be optimized as well as the build timeline thru integrated modeling, simulation, visibility & tracking. This will help to achieve customers demanding schedule and ensures sustainable future of the fab.



## HOW WOULD YOU IMPROVE TIME TO MARKET?

1

### Competition is fierce and early technology adopters can gain a competitive advantage You can accelerate to meet the booming demand

To meet market demand, semiconductor manufacturers need to increase capacity. They have options such as increasing manufacturing capacity of existing fabs whenever possible or build new fabs. The latter gives manufacturers more room for growth and plan for future expansion but also introduce a challenge to build the fab in a very tight schedule. Manufacturers determine the right choice and then create a plan to meet these growth goals.

It takes about

**12 to 24 months**

to build a shell of a fab and install the required tools, plus another 12 to 18 months to ramp up to full capacity.

Source: McKinsey

It typically takes

**85 days**

to manufacture a chip and the process encompasses up to 300 separate operations.

<https://time.com/6075425/semiconductor-chip-shortage/>



## WHAT WILL MAKE THE BIGGEST IMPACT ON IMPROVING TIME TO MARKET?

2

### Optimization and digitalization of the Fabs Digital tools and modularity are at the heart of improvements

Building new semiconductor fabs and upgrading existing facilities requires digital tools and modular solutions to follow a step-by-step process for improvements that addresses fabs' needs - both immediate and future.

Improving Fabs design and build



#### Fab Design and Build – complete the project within the schedule

Designing and building a Fab in a very tight schedule requires a platform that enables multi-stakeholders to interact with each other dynamically and in real-time sharing single source of truth. Centralizing project life cycle management helps eliminate info silos and keep teams on the same page.

Fab construction – nowadays Building Information Modeling (BIM) is essential and commonly used in architecture, engineering, and construction (AEC) industry specially for complex infrastructure. BIM (3D) models when connected with time (4thD) and cost (5thD) data for project planning and execution allows user to optimize schedules and costs. Together with Sustainability (6thD), it optimizes resource planning and procurement planning to reach the lowest carbon level. Using BIM 6D digital tools, it allows multi-stakeholders' early involvement to develop the solid plan using **6D simulation to reduce risk and rework**. It also provides full visibility and transparency of project execution to optimize schedules, activities and carbon emissions as required.

Fab electrical distribution - Like any other manufacturing industry, electrical distribution is one of the essential utilities for Fab operation. Using advance digital tools to design and analyze your overall electrical distribution with support from power system experts that can help you optimize and standardize your power system architecture, it allows to speed-up the electrical distribution design that is scalable, future-ready, and compliant with industry standards.



#### Fab energization – start production safely on time

Semicon Fabs requires high level of power resiliency – reliability, availability, quality, and scalability.

Accelerating towards an intelligent electrical network digital tools that offers integrated power system study and simulation reduce the risk and ensure a safe and resilient power distribution. This gives end-user peace of mind when energizing the fab. By having an electrical digital twin, it allows a smooth transition from designing to operation & maintenance of electrical distribution.

Fabs are built using inside-out approach. Design starts with the manufacturing process that drives the function and operation of the facility, hence, though power is so critical it is often finalized at the later stage of the project that leads to a challenging supply chain to meet Fab energization target. Prefabricated solutions such as modular skid mounted, and e-house can be considered for fast delivery and can reduce installation time, testing, commissioning, and energization.



## WHY IS SCHNEIDER ELECTRIC THE BEST PARTNER FOR HELPING YOU MEET DEMAND?

3

We help you power and digitize  
You can rely on us to drive productivity and chip production

Design

Build

Operate & Maintain

Schneider Electric Exchange  
and strategic alliances  
End-to-end Cyber security

**EcoStruxure**  
Power Design **etap**  
Electrical Design Services



**etap** **EcoStruxure**  
Advisors



EcoStruxure Power Advisor EcoStruxure Plant Advisor  
EcoStruxure Asset Advisor



EcoStruxure Augmented  
Operator Advisor

Ecostruxure Edge Control



Modular SKID  
mount / E-house

Connected Products

### Digital tools and services

#### Electrical Design Services

With decades of experience within the power industry and a future-ready platform, we help energize the fabs of tomorrow, providing **efficiency, resiliency, and sustainability** from our technical experts.

We can help you reduce project deployment time during the design and build phase whilst also improving performance in the most sustainable manner.

#### ETAP

ETAP is an industry-leading software used to design, simulate, and **optimize power system architectures** and reduce design errors. Many of the world's top manufacturers rely on ETAP to develop power systems that meet rigorous operational and quality requirements, such as those demanded by semiconductor fabs.

With the integration offered by ETAP and EcoStruxure Power edge layer software, it allows smooth transition from designing to operation and maintenance of your electrical distribution.

#### RIB software

This BIM 6D tool smooths the construction phase, and includes traditional 3D modeling and optimized project scheduling, as well as **financial planning** tools and sustainability management. This cost component means improved visibility and tracking of material delivery milestones (BOM references) so project cash flow can be properly managed. The integration of all 6 dimensions of BIM 6D brings many advantages through project automation, including the immediate visibility of a design change's consequences on construction schedule, cost and carbon emission level.

#### Prefabricated modular skid mount and e-house solutions

Prefab solutions are pre-engineered, and factory assembled - designed and built to precise specifications in a controlled factory environment and utilize the right EcoStruxure software which results in improved reliability.

Prefabricated solutions arrive on site and ready to be deployed which significantly **reduces installation time and costs.**

Next Step:  
To learn more visit [se.com/semiconductor](http://se.com/semiconductor)

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