
Capgemini
MEGA IDEAS
POWERFUL IMPACT
Transforming industries
through innovation

Innovation distinguishes between a leader and a follower

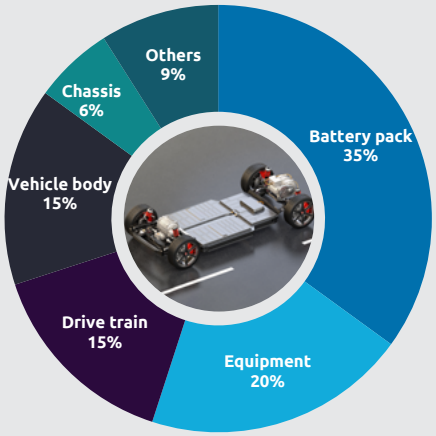
- Steve Jobs

Ever since the UN Sustainable Development Goals came into force in 2016, the world has been pushing for sustainable change. Awareness about the state of our planet has been growing, with corporations taking the lead to reduce their carbon emissions and switch to more environment-friendly methods. With the resulting rapid development of technologies, including cloud, IoT, AI, and more, the new era of digital transformation – called Intelligent industry – has set in.

The automotive sector is at the forefront of this evolution by transitioning to electric vehicles, leading to the emergence of the "Gigafactory." Industry leaders require a business and technology transformation partner to drive efficiencies and speed to market, and to address key challenges, including:

1. Accelerate time to market and ramp up manufacturing capabilities – currently, it takes 5-7 years to build and run a factory
2. Meet traceability or regulatory concerns and sustainability expectations, like carbon footprint reduction and recycling
3. Ensure ethical sourcing in a world challenged with raw material scarcity
4. Keeping abreast with evolving battery chemistry and design
5. Improve quality and reduce scrap; even a 10% reduction in scrap could save $200-$300 million per annum for a 30GWh factory
6. Adapt, innovate, and stay ahead of the competition
7. Ensure every piece of technology involved and every battery made aligns to safety guidelines
8. Accelerate talent acquisition, development, and retention of specialized experts.

EV cost structure



Did you know the battery is the costliest component of an EV?

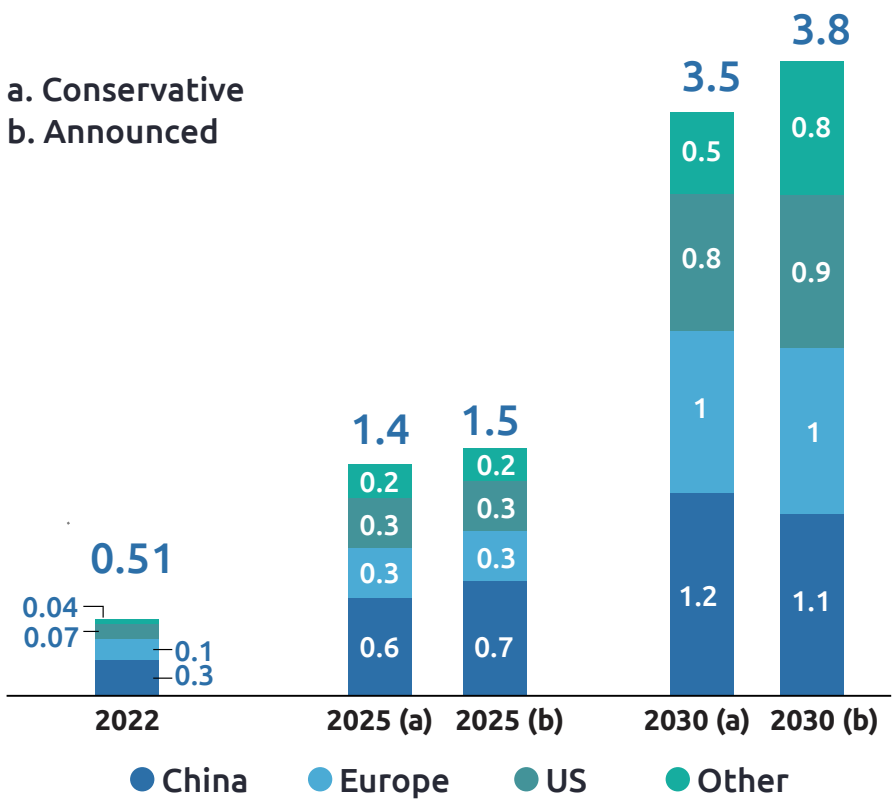
A single lithium-ion battery requires varying amounts of graphite, aluminium, nickel, copper, cobalt, lithium, manganese, and iron. Each of these materials is used extensively in each industry, especially copper, which is facing a global shortage. Add to it changing regulatory guidelines, the need to reduce costs, poor quality control, and a heavy carbon footprint, and we are looking at a production line with gigantic complexity and challenges.

Capgemini's expertise is poised to make a difference by taking EV battery manufacturing to the next level:

- By reducing the cost of batteries and helping increase EV adoption rate
- By making batteries long-lasting and reducing TCO.

Battery production and the future of EV manufacturing

EV battery demand until 2030 (in TWh)



Rapidly increasing EV battery demand is expected to hit 3.8 TWh (Terawatt-hour) globally. Not only luxury car manufacturers, but public transportation too is making an entry into the electric energy industry. However, this is not without its challenges. Companies need to work at breakneck speed to meet the growing needs while expanding their scope and volume of production of batteries to stay in the race. For battery production to be successful and profitable at this scale, the need of the hour is advanced technology and processes that can offset product costs, lower TCO, and increase EV adoption by:

1. Shifting to sustainable transportation and lowering the carbon footprint
2. Producing lithium-ion batteries at scale by harnessing specialized skills across multiple disciplines
3. Harnessing the power of real-time end-to-end data analysis in the battery and EV production process
4. Building long-term relationships with partners and suppliers and developing a regional end-to-end supply-chain ecosystem
5. Reducing waste, by enhancing efficient resource usage and intelligent reusing of biproducts
6. Repurposing the battery to serve as an efficient energy storage option for its second lifecycle too.

Delivering success

You can benefit from Capgemini's proven track record of deep industry expertise delivered by 60,000+ best-in-class strategic and technological experts. Our sustainability-first approach ensures every solution we customize for our clients not only boosts the bottom line but also reduces our carbon footprint.

Aspiring for progress

We partner with clients to help them get and keep a competitive edge by setting goals:

1. Standardizing the battery production process, which removes variability in quality and performance
2. Designing a new battery module, while considering constraints of energy capacities, the environment, and international market standards-
3. Developing a lean digital strategy that sets direction, understanding, and focus areas for greenfield battery production-
4. Establishing a common digital ambition and roadmap in line with ambitious goals on speed, scale, and sustainability, using digitalization as a key enabler.

Taking action now-

We will chart a systemic approach to design, plan, and execute your vision for a digital-native battery factory, with a plan for continuous improvement as technologies advance.

1. **Defining a vision and strategy.** A team of seasoned experts will collaborate to formulate a strategic blueprint that ensures seamless governance, program management, and process improvement.
2. **Building the digital architecture.** From design and deployment to maintenance, we enable the digital architecture, which includes 5G wireless connectivity and IT/OT.
3. **Engineering the product line.** The physical design, operation, and maintenance of product lines ensures the delivery of high-quality, scalable battery production. Accelerate talent acquisition and development.

Attaining goals

We infuse intelligence and innovation in everything we do, with a human-centered design that promotes future-proof transformation. Read on to learn how Capgemini delivers value to your manufacturing.

1. Ensuring efficient and effective manufacturing operations by redefining production lines
2. Integrating both digital and physical components of production to streamline manufacturing processes
3. Achieving full traceability from factory to process to product
4. Maintaining blueprints to quickly enable operations across locations
5. Using simulation to evaluate scenarios and make data-driven decisions that cut down on investments and optimize production
6. Evaluating energy consumption for multiple production scenarios
7. Proactively identifying and mitigating disruption risks across end-to-end business processes

We have helped our clients:

1. Execute **portfolio optimization and the rollout of 200+ plants** for a German engineering and tech giant with modular, flexible, and extendable manufacturing capabilities.
2. Achieve **a reduction in lead time** for new line deployment, enable seamless replication of existing lines, and improve the efficiency of updating current lines at an American multinational automotive and clean-energy company.
3. **Streamline workflow at 20+ plants** for a Dutch multinational automotive manufacturing corporation and achieve faster time to market by:
    a. Enhancing battery manufacturing alongside car production, minimizing packaging, transportation, and labor costs
    b. Enabling production traceability for accurate demand and supply projections, reducing carbon footprint and lead time.
4. **Establish a single source of truth for all the information** pertaining to a vehicle's lifecycle for a Swedish EV manufacturer.
5. Enhance cost-efficiency for a luxury car manufacturer by **reducing vehicle weight by 50% and increasing the electric range by 50% with over 90% recyclable, sustainable materials.**
6. **Set up a state-of-the-art and efficient production facility for low-carbon batteries** for a renowned French high-performance battery manufacturer.

Not only will electric batteries make our daily commute more sustainable, but they also help lower emissions and fight climate change, which makes this a matter of when, and not if. It's time to take the first step towards revolutionizing the industry and redefining what power means. Let Capgemini help you unlock a more intelligent manufacturing experience for your business and Get The Future You Want!

About Capgemini

Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided every day by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of nearly 350,000 team members in more than 50 countries. With its strong 55-year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fueled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering, and platforms. The Group reported in 2022 global revenues of €22 billion (about $23 billion USD at 2022 average rate).

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