

Why EV Design, Development, and Production Require Digital Twin Technology

The shift to hybrid and pure electric vehicles (EVs) brings significant changes to all aspects of auto manufacturing, including design, development, production, and supply chains. Vehicle architecture, crash safety, electrical systems, and software development all need to be reimaged for all forms of EVs. Leading manufacturers are turning to digital twin technology to address these issues.

EVs by the Numbers

> 1 in 5

More than **one in five cars** sold worldwide in 2024 will be electric.
(Source: [IEA](#))

90% lower

Electric Vehicle batter pack costs are **90% lower** than in 2008.
(Source: [DOE](#))

~Half

Over its lifetime, the average new electric vehicle produces **about half** the the greenhouse gas emissions of an equivalent vehicle burning gasoline or diesel.
(Source: [Union of Concerned Scientists](#))

62% to 86%

Electric vehicles will account for **62% to 86%** of global sales by 2030.
(Source: [RMI](#))



Top Challenges



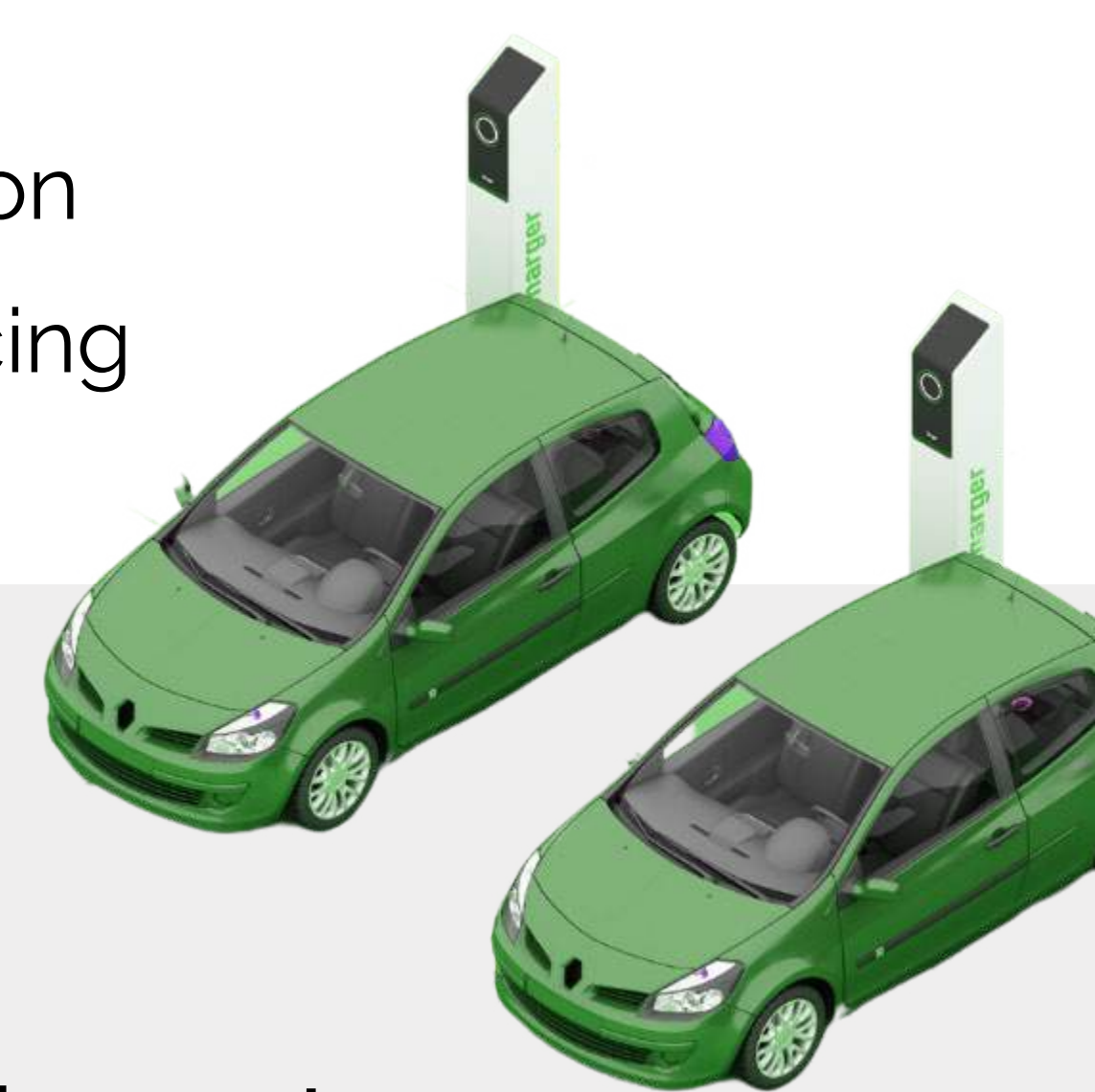
Design Challenges

- Battery efficiency and range
- Vehicle dynamics
- Thermal management



Development Challenges

- Battery technology
- Software and integration
- Material and parts sourcing



How Digital Twin Help

Vehicle Design and Optimization

- Replicate physical properties
- Simulate real-world conditions
- Test different scenarios

Manufacturing Process Optimization

- Test assembly line workflows
- Simulate manufacturing processes
- Identify bottlenecks

Battery Development and Management

- Optimize battery life
- Simulate battery performance under different conditions
- Monitor battery health

Benefits

- Faster design iterations
- Reduced costs
- Easier to innovate

- Efficient production processes
- Lower production costs
- Reduced downtime

- Improved battery performance
- Extended battery life
- Enhanced safety

How Siemens Helps

Siemens offers a comprehensive suite of solutions to support the use of digital twins in the design, development, and production all forms of electric vehicles (EVs). Its offerings are part of the broader Siemens Xcelerator portfolio, which integrates software, hardware, and services to enable digital transformation in industries, including automotive.