



# 7 Arenas for Engineering COMPETITION

A recent report identified industries poised to transform the business landscape and reshape the global economy. Seven of those industries have close identification with mechanical engineers.

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Not all industries are created equal. Some may provide steady employment for workers and dependable profits for owners, but don't offer much in the way of growth or innovation. Others, especially those enjoying the fruits of technological breakthroughs, not only have the potential to make the winners in those spaces very rich, but also could transform the economy in ways that send ripples throughout the business landscape. Smartphones, for example, didn't just change the way we talk to each other, but have transformed retail, media, and even dating.

Recently, the McKinsey Global Institute (MGI), the research arm of McKinsey & Co., released a report called, "The Next Big Arenas of Competition," which identified 18 industries that are on the precipice of making a splash similar to (if not on the same scale as) smartphones. What's more, the identified industries are still dynamic enough that the ultimate handful of winners has yet to be decided.

While many of these industries or product lines are not engineering-related, several of them feature key contributions from mechanical engineers. Here are the competitive engineering industries MGI identified:

## ELECTRIC VEHICLES



MGI identifies the reduced cost of ownership for EVs and mandates sunsetting traditional vehicles as catalysts for growth in EV sales, with sales projected to quadruple by 2030. While the automobile segment is at the moment dominated by a handful of companies, such as BYD, Geely, and Tesla, established companies such as Ford and Hyundai and startups like Polestar and Lucid look to shake up the industry.

## SHARED AUTONOMOUS VEHICLES



This industry, which combines self-driving cars with a robo-taxi business model, is still getting off the ground, but MGI reports more than 400 companies have invested in the field. Each one is looking to put together autonomous driving technology and the physical cars, with the logistics of a shared mobility service that's cheaper than owning a car and could lead an industry worth \$2 trillion by 2040.

## SPACE



The exponential decrease in launch costs together with a growing number of commercial innovators makes the space sector ripe for disruption. Communications platforms such as Kuyper and Starlink or nanosatellite provider Spire Global are developing new business models for the commercialization of orbital space, while other companies are looking to push down launch costs further, making space even more accessible to private enterprise.

## MODULAR CONSTRUCTION



In an age of mass production, construction is stubbornly old-fashioned. MGI reports that modular construction, in which standardized, factory-built modules are assembled at the building site, could cut construction time in half. MGI projects that modular construction could grow into a trillion-dollar industry by 2040, with engineers getting increasingly involved in companies manufacturing these new products.

## ROBOTICS



Robots have been around for decades, but MGI reports that a recent influx of investment is pushing the boundaries of the industry into agriculture, hospitality, and domestic service markets. As MGI reports, "Our higher range of scenarios assumes ... a high degree of integration between humans and robots in daily interactions." Companies that are dominant in single-use robotics, such as ABB, Fanuc, and Kuka, may not necessarily break into these consumer-facing markets.

## FUTURE AIR MOBILITY



MGI reports that price, customer preference, and battery performance will determine to what degree electric vertical takeoff and landing vehicles and delivery drones can transform the regional transportation market. Because the industry is so new, no major players have emerged and the segment promises to be highly competitive. MGI forecasts the market for air mobility will remain modest to 2040, so the "prize" for whichever companies dominate the industry may be small.

## NUCLEAR FISSION POWER PLANTS



With global electric demand expected to double by 2040, nuclear power's ability to provide clean and dependable power is gaining attention. Limiting factors in nuclear's growth are the cost of building new plants and seriousness of countries toward meeting decarbonization goals. The best-case scenario for nuclear could see a rapid buildout, and new entrants in the field such as TerraPower or LeadCold in Sweden could rival established market leaders.