

MARCH 2022

# INVESTING FOR THE FUTURE

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LEADING IN CAPITAL INVESTMENTS AND  
RESEARCH & DEVELOPMENT

AMERICAN AUTOMAKERS  
**AAPC**



STELLANTIS

# CAPITAL INVESTMENTS

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# HOW AUTOMAKER INVESTMENT JUMPSTARTS JOBS AND ECONOMIC DEVELOPMENT

1.

THE GLOBAL AUTO  
INDUSTRY RANKS #2 IN  
CAPITAL INVESTMENTS



ANNUAL GLOBAL INVESTMENTS:  
**\$194 BILLION**

2.

FORD, GM & STELLANTIS  
LEAD THE WAY IN THE U.S.

FROM 2009-2019, THEY  
INVESTED:



3.

WHEN AUTOMAKERS INVEST  
IN PRODUCTION, SUPPLIERS  
FOLLOW THEIR LEAD



# THE AUTO INDUSTRY FUELS THE GLOBAL ECONOMY

## EVERY YEAR, THE AUTO INDUSTRY INVESTS BILLIONS IN PRODUCTION

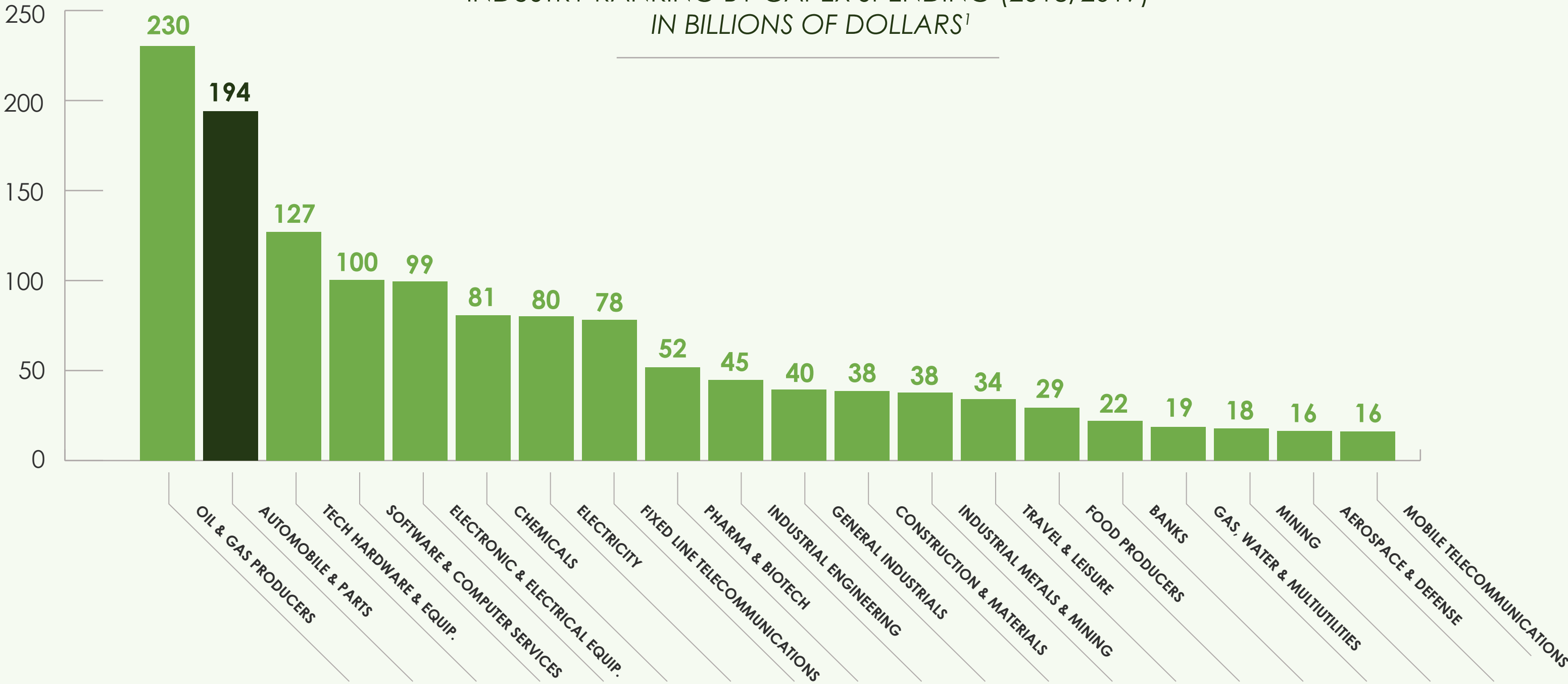
Automakers assemble approximately 85 million new cars and light trucks each year, worldwide. Building new plants and maintaining existing ones requires more than \$190 billion in investment each year.



## THE AUTO INDUSTRY INVESTS MORE THAN OTHER INDUSTRIES

A recent study by the European Commission examined the capital investment (plants and equipment) of 2,500 of the world's leading companies. The study found that automakers and their suppliers spent more on capital investment than electrical utilities, telecommunications companies, electronic and electrical manufacturers, chemical manufacturers, and software and computer services companies.

INDUSTRY RANKING BY CAPEX SPENDING (2018/2019)  
IN BILLIONS OF DOLLARS<sup>1</sup>



# FORD, GENERAL MOTORS, AND STELLANTIS' INVESTMENTS MAKE AMERICA MORE COMPETITIVE

## FORD, GENERAL MOTORS, AND STELLANTIS INVEST IN THEIR OPERATIONS ACROSS THE COUNTRY

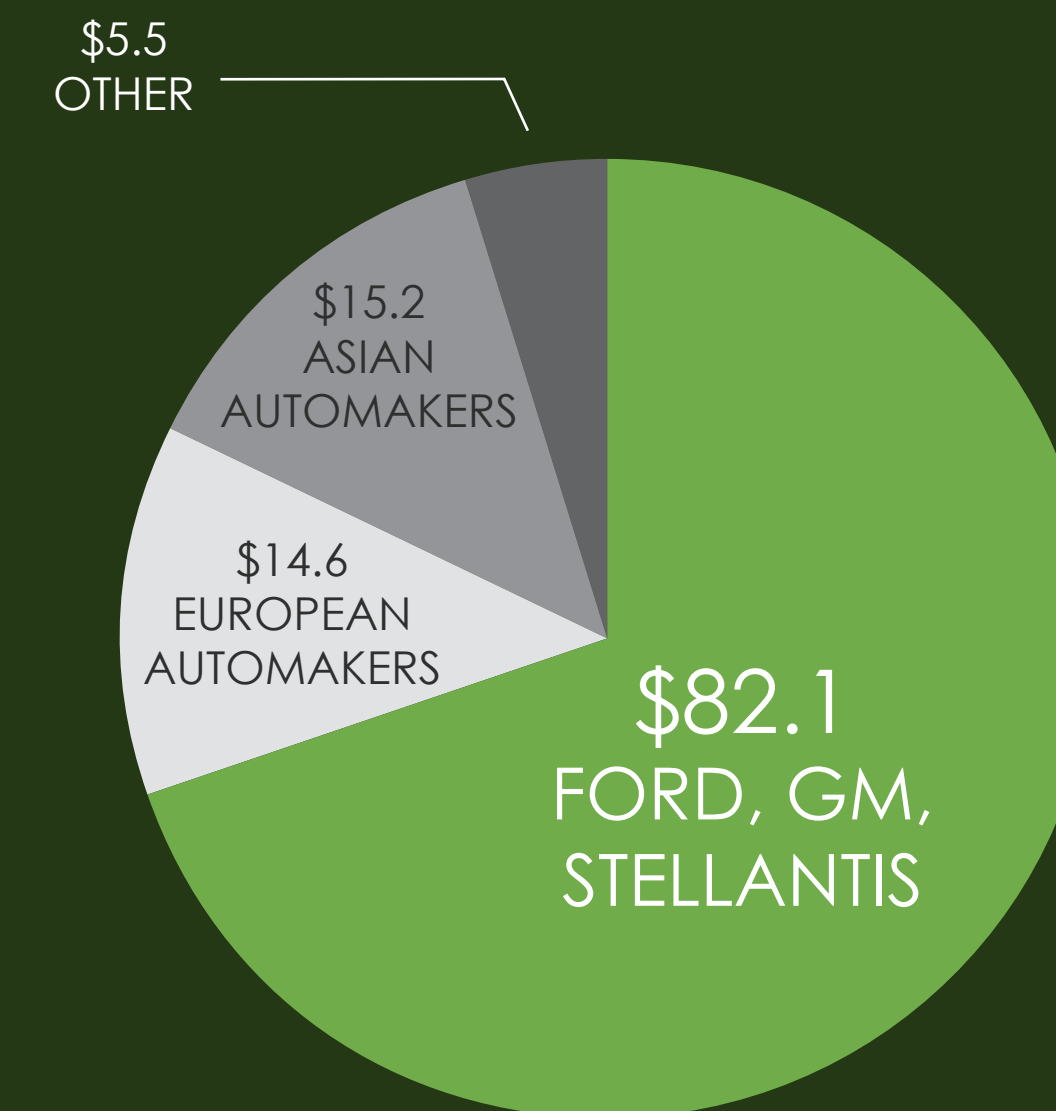
Building a new plant costs between \$1 billion and \$2 billion. Improving an existing plant to allow for multiple platform production, or to take advantage of new process improvements, can cost several hundred million dollars. Both investments create jobs and help maintain America's competitive advantage, but a new plant will generate hundreds of headlines, while existing plant improvements tend to go unnoticed.



## FORD, GENERAL MOTORS, AND STELLANTIS INVEST 2.5X TIMES THEIR COMPETITORS IN THE U.S.

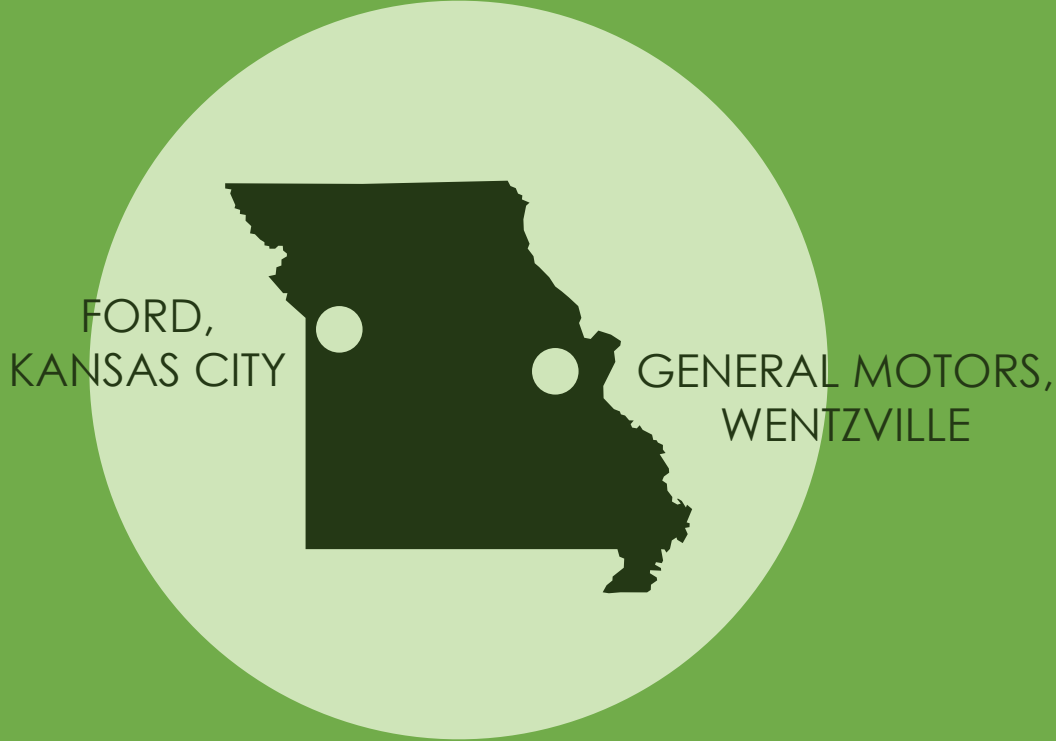
Domestic and foreign automakers announced investments of \$117.3 billion in their U.S. assembly, engine and transmission plants, R&D labs, headquarters, administrative offices, and other facilities from 2009 through 2019. Roughly 70% of these investments came from Ford, General Motors, and Stellantis.

ANNOUNCED U.S. CAPITAL EXPENDITURES (2009-2019)  
IN BILLIONS OF DOLLARS<sup>3</sup>



# WHEN AUTOMAKERS INVEST IN AMERICA, SUPPLIERS FOLLOW

## CASE STUDY: MISSOURI



FORD AND GM ANNOUNCED  
**\$3.7 BILLION**  
IN INVESTMENTS FROM 2009 TO 2020



AUTO SUPPLIERS ANNOUNCED  
**\$635 MILLION**  
IN PLANNED INVESTMENTS IN THEIR OWN MISSOURI OPERATIONS<sup>4</sup>

## CASE STUDY: MICHIGAN



STELLANTIS, FORD, AND GM ANNOUNCED  
**\$39 BILLION**  
IN INVESTMENTS FROM 2009 TO 2020



STELLANTIS  
4 ASSEMBLY PLANTS

FORD  
3 ASSEMBLY PLANTS

GENERAL MOTORS  
5 ASSEMBLY PLANTS

AUTO SUPPLIERS ANNOUNCED  
**\$14 BILLION**  
IN PLANNED INVESTMENTS IN THEIR OWN MICHIGAN OPERATIONS<sup>5</sup>

# RESEARCH AND DEVELOPMENT

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# WHY AUTOMOTIVE RESEARCH AND DEVELOPMENT MATTERS

- 1. The global auto industry invests billions in R&D annually, creating value across the world.** Auto manufacturers and suppliers are responsible for 16% of global R&D, ranking third only behind pharmaceuticals and technology hardware.<sup>6</sup>
- 2. Ford, General Motors, and Stellantis are among the world's top investors in R&D.** Each invests more in R&D than Facebook, HP, DOW, or ExxonMobil.<sup>7</sup>
- 3. Automakers' investments in R&D power the U.S. economy.** Because cars are a high-tech business, and because the automotive supply chain is so big, automakers and their suppliers employ nearly 1 out of 10 corporate scientists and engineers working in the U.S.<sup>8</sup>
- 4. Ford, General Motors, and Stellantis R&D is driving new sales, production, and jobs across the U.S. — and this success is attracting supplier and competitor investments.** This job-creating cycle is critical to the U.S.'s economic competitiveness.

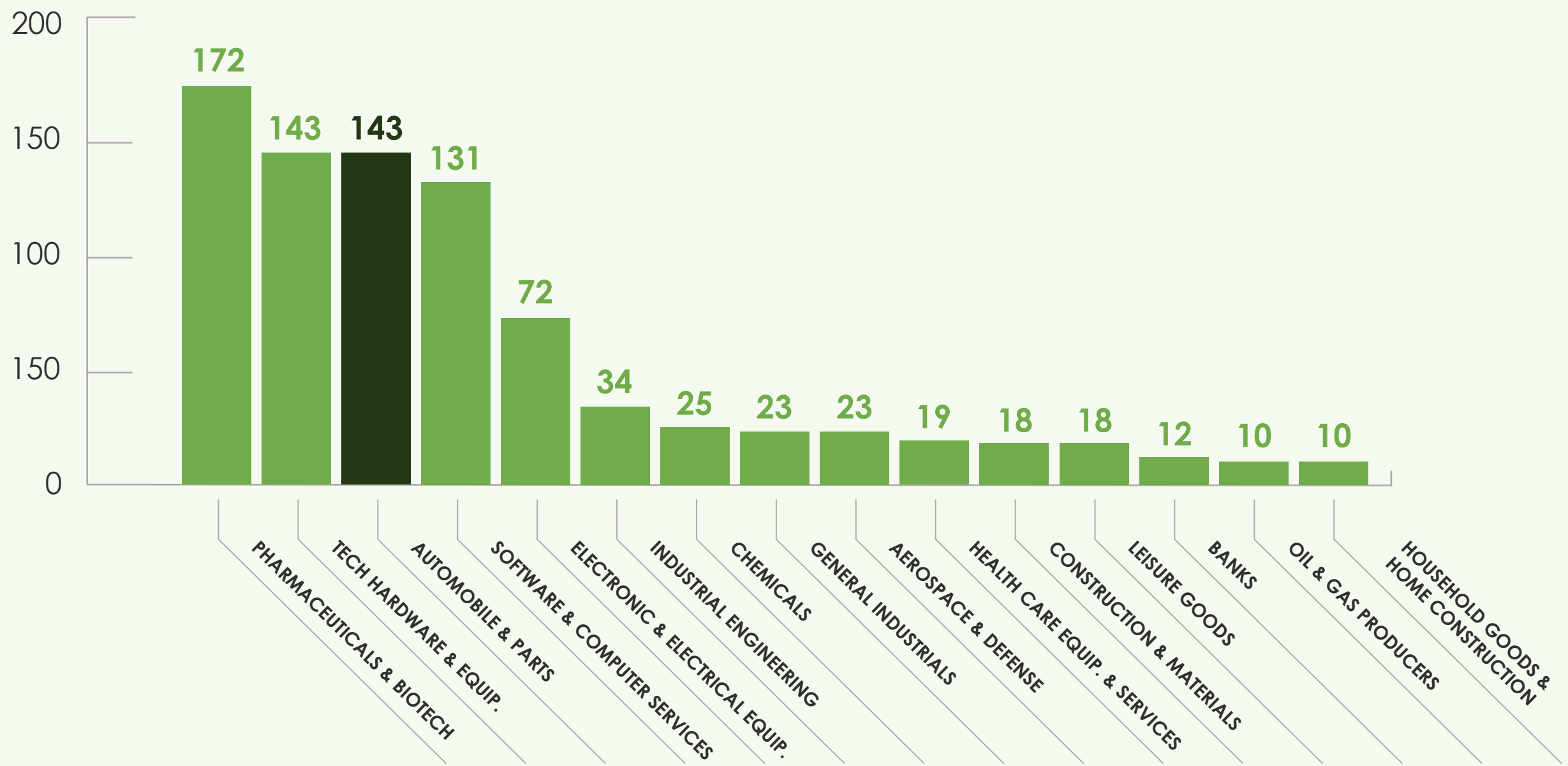


# THE GLOBAL AUTO INDUSTRY INVESTS BILLIONS IN R&D ANNUALLY, CREATING VALUE ACROSS THE WORLD

## THE AUTO INDUSTRY RANKS THIRD IN GLOBAL R&D SPENDING

Designing and producing autos is a massive engineering challenge, which is why automakers and their suppliers invest \$143 billion in R&D each year – behind only pharmaceuticals and technology hardware.

INDUSTRY RANKING BY R&D SPENDING (2018/2019)  
IN BILLIONS OF DOLLARS\*



## AUTO R&D'S SCALE AND SIGNIFICANCE

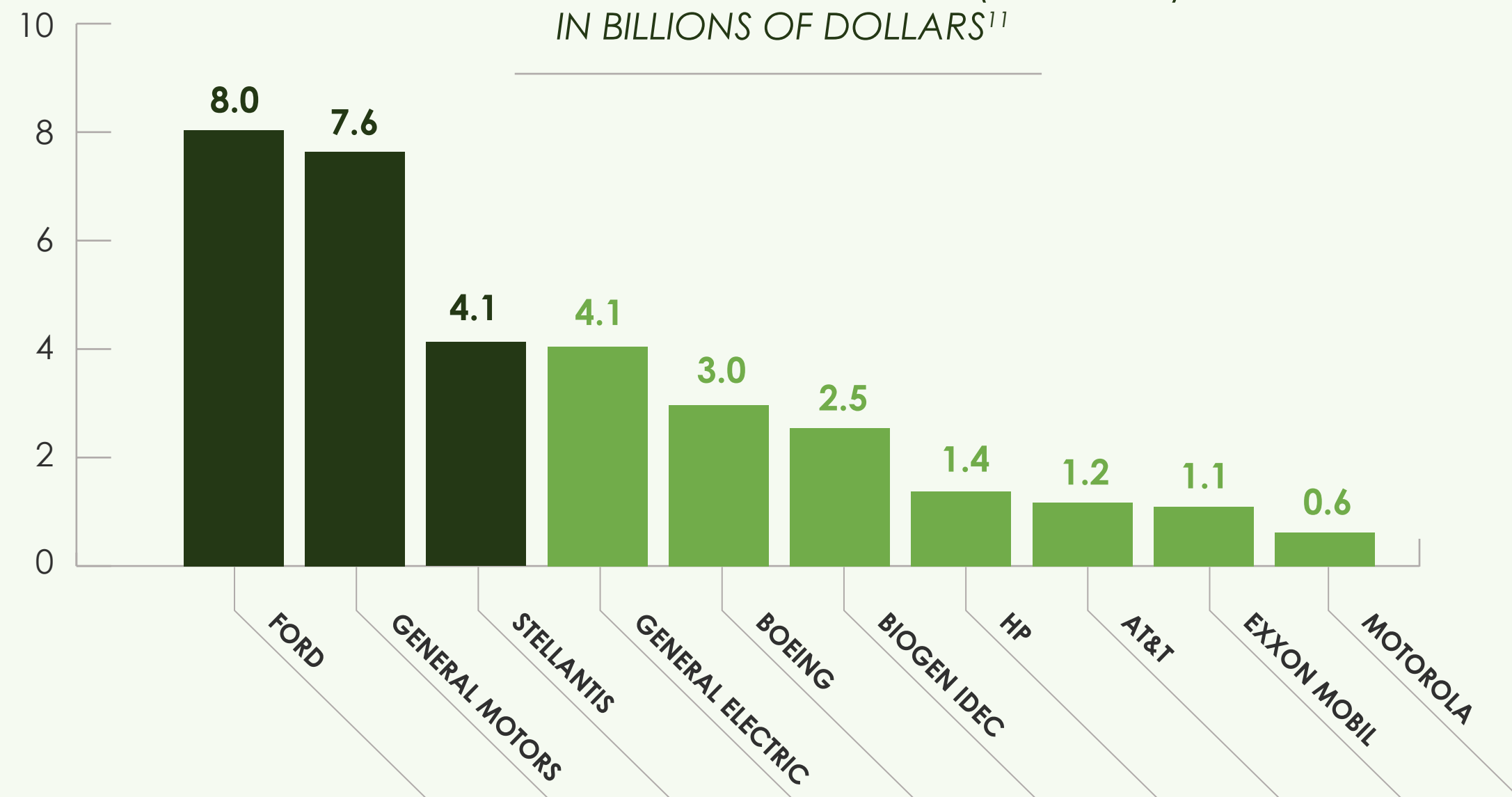
To appreciate the scale and significance of automotive R&D, consider several findings from CAR's report, "Just How High-Tech is the Automotive Industry?" For example: a new smart phone contains one microprocessor, while a new car or truck contains about 60. These microprocessors manage 100 or more sensors located throughout the vehicle, connected by as much as a mile of wiring. Just as important, a microprocessor in a smart phone is expected to last about three years, while autos are expected to last 12 years or more.<sup>10</sup>

# FORD, GENERAL MOTORS, AND STELLANTIS ARE AMONG THE WORLD'S TOP INVESTORS IN R&D

## COMPARED TO OTHER LEADING INNOVATORS' R&D

Ford, General Motors, and Stellantis each invest more in R&D than many of the world's leading IT, defense, biotech, and energy giants, including Boeing, HP, AT&T, and ExxonMobil.

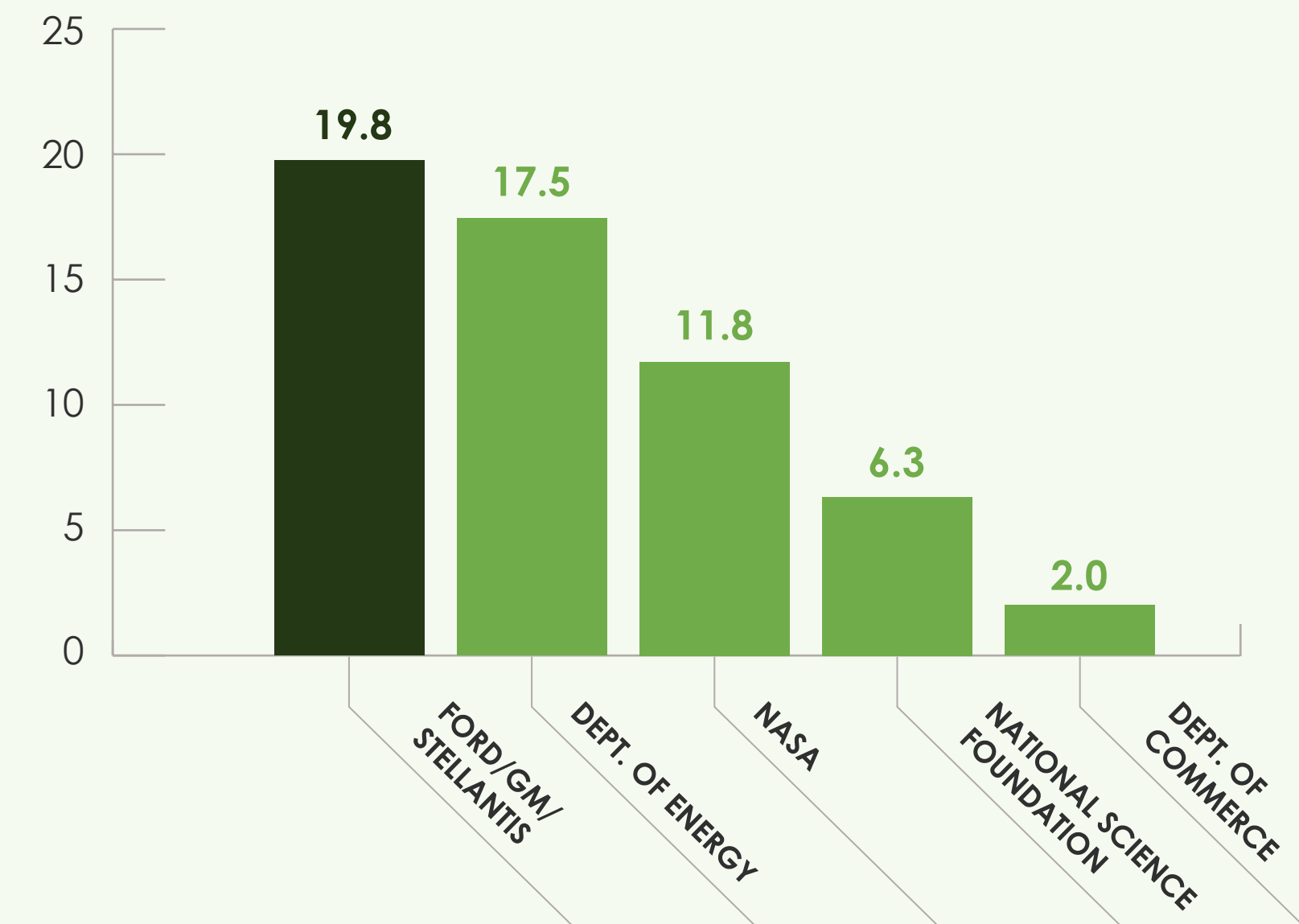
FORD, GENERAL MOTORS, AND STELLANTIS' ANNUAL R&D VS. OTHER LEADING INNOVATORS (2018/2019) IN BILLIONS OF DOLLARS<sup>11</sup>



## COMPARED TO U.S. GOVERNMENT R&D

Together, Ford, General Motors, and Stellantis invest nearly twice as much each year as NASA (\$19.8 billion vs. \$11.8 billion)

FORD, GENERAL MOTORS, AND STELLANTIS' ANNUAL R&D VS. GOVERNMENT R&D (2018/2019) IN BILLIONS OF DOLLARS<sup>12</sup>

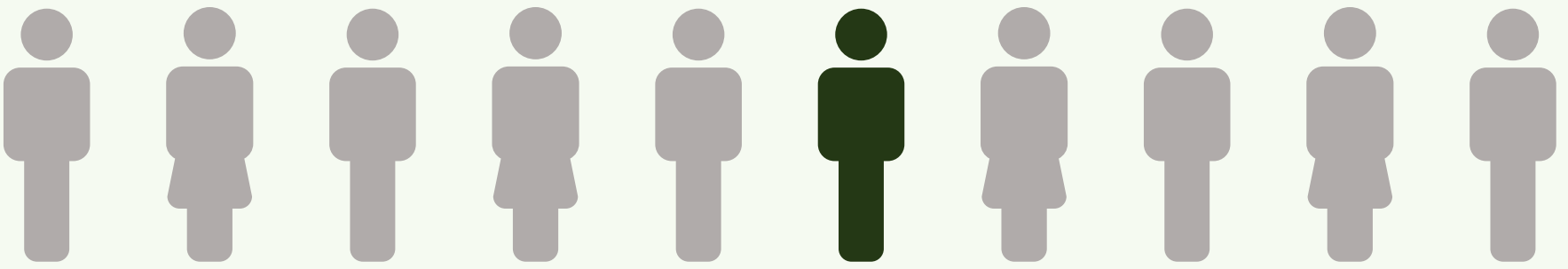


# AUTOMAKERS' INVESTMENTS IN R&D POWER THE U.S. ECONOMY

## MANUFACTURING R&D DRIVES MORE VALUE AND EMPLOYS MORE PEOPLE THAN OTHER R&D IN THE U.S.

The manufacturing sector drives 70% of private-sector R&D<sup>13</sup> and employs 60% of R&D employees in the U.S.<sup>14</sup>

## NEARLY 1 IN 10



OF THE U.S.'S ENGINEERS AND SCIENTISTS IN THE PRIVATE SECTOR ARE EMPLOYED BY AN AUTOMAKER OR ONE OF ITS SUPPLIERS<sup>15</sup>

## AND AUTOMAKERS POWER THE MANUFACTURING SECTOR IN THE U.S.

In 2019, U.S. automakers and suppliers invested nearly \$26 billion in R&D, much of that developing alternative fuels, advanced powertrains, new materials, and better sensors.<sup>16</sup> As a result, automakers and their suppliers employ nearly 1 in 10 U.S. engineers and scientists working in the private sector.<sup>17</sup>

IN THE U.S.,  
AUTOMAKERS &  
SUPPLIERS INVESTED  
**\$26 BILLION**  
IN 2019



ON AVERAGE,  
THIS REPRESENTS  
APPROXIMATELY  
**\$1,500**  
PER CAR SOLD

# FORD, GENERAL MOTORS, AND STELLANTIS R&D IS DRIVING NEW SALES, PRODUCTION, AND JOBS ACROSS THE U.S. — AND THIS SUCCESS DRIVES SUPPLIER AND COMPETITOR INVESTMENTS

### R&D DRIVES INNOVATION

Automakers and their suppliers are significant drivers of patents. Each year, automakers, auto suppliers, and auto entrepreneurs from around the world file for nearly 60,000 patents with the USPTO.<sup>18</sup>

### INNOVATION DRIVES SALES

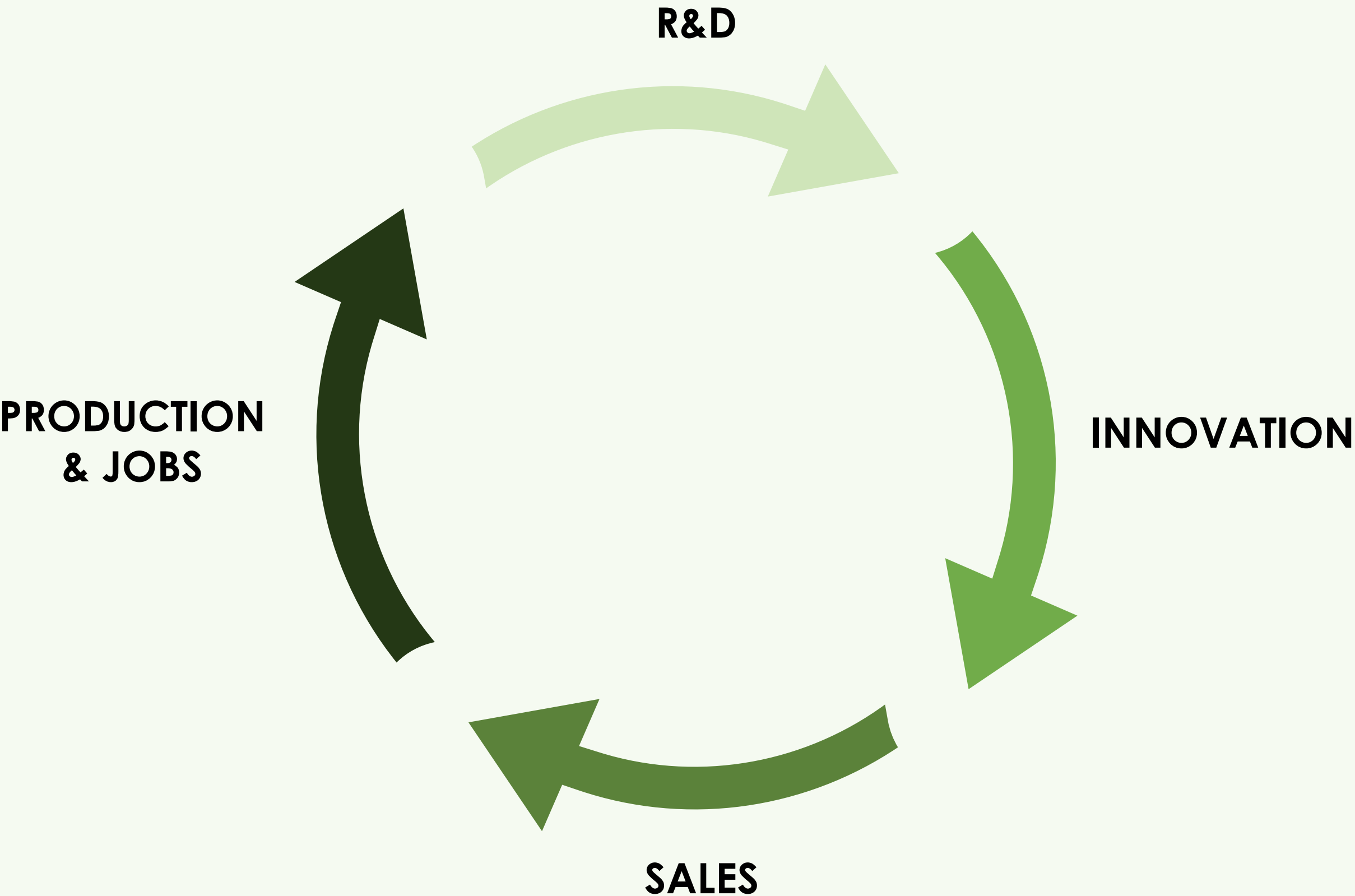
From 2009 to 2019, U.S. sales increased by 64% (10.4 million vehicles sold to 17.1 million vehicles sold). By 2028, the Center for Auto Research (CAR) predicts that sales will increase to 17.6 million.<sup>19</sup>

### SALES DRIVE PRODUCTION AND JOBS

During the same time period from 2009-2019, U.S. production nearly doubled, increasing by 91% (5.6 million vehicles produced to 10.7 million vehicles produced). By 2028, CAR predicts that production will increase to 12.2 million.<sup>20</sup>

### VIRTUOUS CYCLE DRIVING PRODUCTION, JOB GROWTH, AND R&D

R&D does more than drive near-term job growth: it sparks a reinforcing cycle of greater innovation leading to more production, jobs, and R&D. As Ford, General Motors, and Stellantis hire workers and build their supply chains, the cost of doing business in the U.S. drops. As those costs drop, new firms move into the market, driving business costs down further.



# REFERENCES

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2. Automotive News Data Center, *North America car & truck assembly plant directory - 10/15/20* (October 2020).
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4. CAR Book of Deals, 2021.
5. Ibid.
6. European Commission Joint Research Centre, *The 2020 EU Industrial R&D Scoreboard*.
7. Ibid.
8. National Science Board, *Science and Engineering Indicators 2016*.
9. European Commission Joint Research Centre, *The 2020 EU Industrial R&D Scoreboard*.
10. CAR, *Just How High-Tech Is the Automotive Industry?* Hill, Kim, Bernard Swiecki, Debra M. Menk, and Joshua Cregger (January 2014).
11. European Commission Joint Research Centre, *The 2020 EU Industrial R&D Scoreboard*.
12. The Congressional Research Service, *Federal Research and Development (R&D) Funding: FY2020* (March 2020).
13. McKinsey Global Institute, *Making it in America: Revitalizing U.S. Manufacturing* (November 2017).
14. National Science Board, *Science and Engineering Indicators 2016*.
15. Ibid.
16. National Science Foundation estimates U.S. auto industry R&D totaled \$13.2 billion in 2012. Since that time, global auto R&D has increased by 9.9% each year. Assuming U.S. automotive research matched the global rate, baseline auto research totaled 26 billion in 2019.
17. National Science Board, *Science and Engineering Indicators 2016*.
18. CAR, *Just How High-Tech Is the Automotive Industry?* Hill, Kim, MPP, Bernard Swiecki, Debra M. Menk, and Joshua Creeger (January 2014).
19. CAR, *Vehicle Sales and Production Forecasts 2018-2028* (January 2021).
20. Ibid.

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