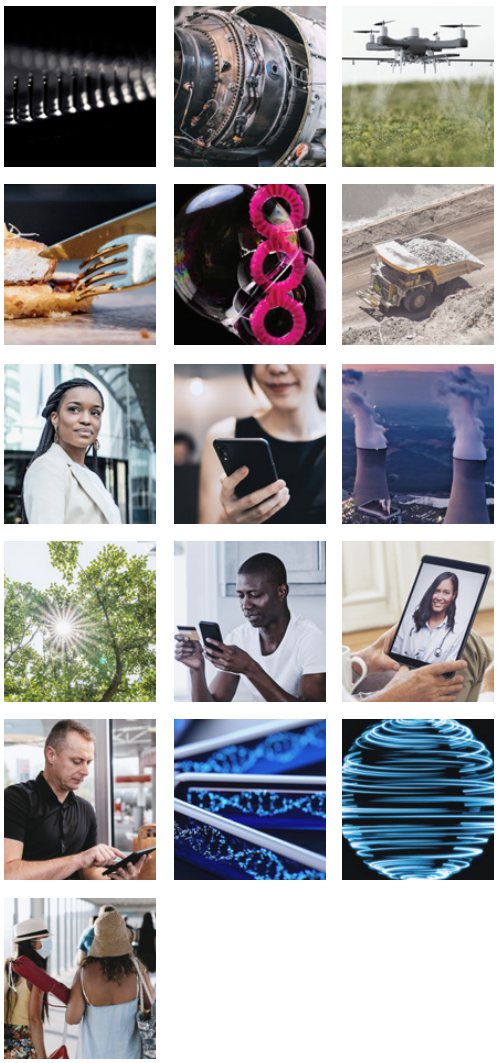
McKinsey & Company

Highlights from McKinsey's 2021 sector research

The pace and scale of change throughout industries as the world has responded to the COVID-19 pandemic is unprecedented. McKinsey experts break down key dynamics of relevance to investors.



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Advanced electronics

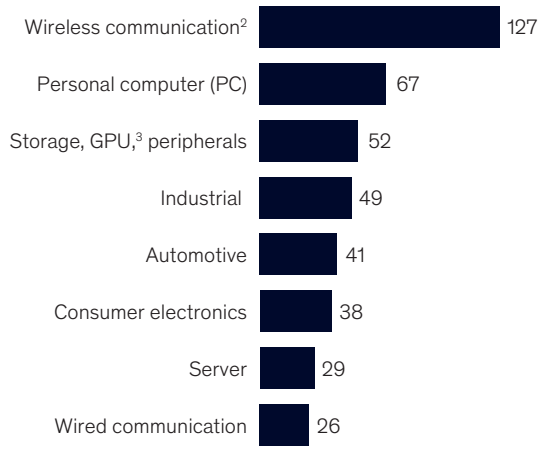
The automotive semiconductor shortage was sparked by the pandemic, but its effects could reverberate long afterwards

by Ondrej Burkacky, Stephanie Lingemann, and Klaus Pototzky

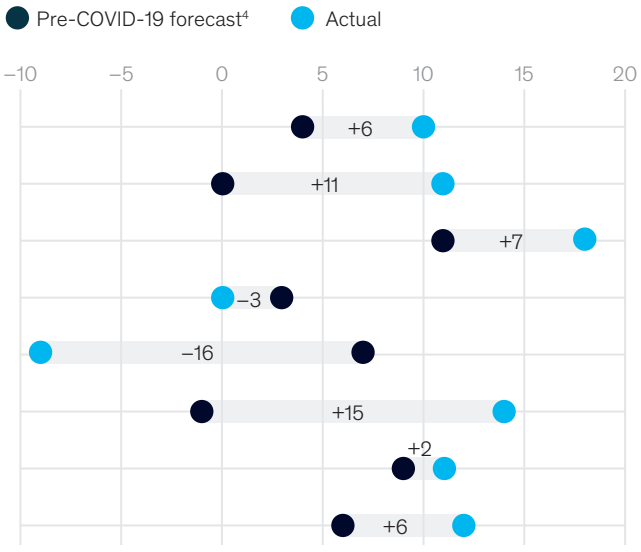
The supply-chain disruptions caused by the COVID-19 pandemic resulted in persistent under-supply of automotive semiconductors. Demand for vehicles plummeted but recovered faster than anticipated; by that point, the semiconductor industry had already shifted production to other applications. Other factors, including demand related to the 5G rollout, will continue to add to supply pressures. OEMs must consider new strategies, including rethinking just-in-time delivery systems, regional sourcing, and possibly in-house design.

Automotive semiconductor sales lagged in 2020, but growth in most other segments is expected to exceed pre-COVID-19 estimates.

Semiconductor sales in 2019 by application,[1]
$ billions



Forecasted vs actual sales growth for 2020, %



[1]Products include actuators and sensors; microcomponents; and analog, discrete, logic, memory, and optoelectronic components.
[2]Includes Chinese inventory effect; growth rate without inventory is expected to be between –4% and –8%.
[3]Graphics processing unit.
[4]As of December 2019. The estimates for 2020 were calculated using a 2019 baseline, and percentages have been rounded.
Source: IHS Markit; Strategy Analytics; McKinsey analysis

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Aerospace and defense

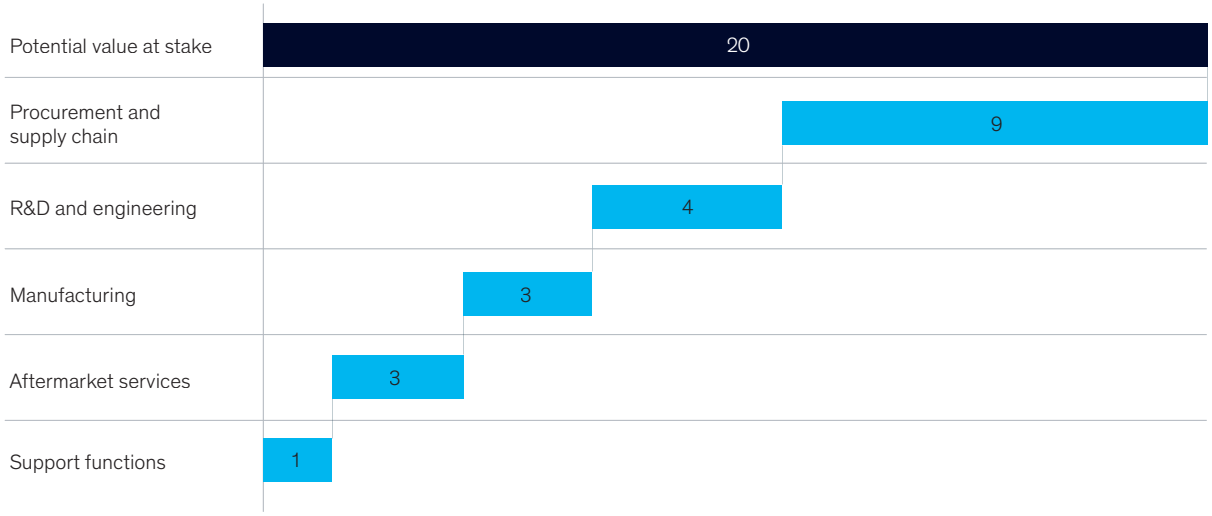
Digitization: The $20 billion opportunity for aerospace and defense

by Reed Doucette, Sophie Hilaire, Varun Marya, and Rob Wavra

Aerospace and defense (A&D) companies create some of the world's foremost technological marvels and have pioneered many different applications of digital and analytics technologies. Ironically, these industries still have a long way to go to leave behind paper-based processes, fragmented data systems, and stubbornly manual operations. A&D will need to transform how it approaches digital across strategy, talent, delivery, technology, data, and adoption. McKinsey's estimate of the potential prize: $20 billion in incremental annual earnings before interest, taxes, depreciation, and amortization (EBITDA), an approximately 10 percent improvement based on the global sector EBITDA of $200 billion in 2018. This value would come from both cost and growth opportunities across the value stream—from engineering to supply chain, manufacturing, aftermarket services, and support functions.

Global aerospace and defense companies could unlock more than $20 billion in potential value from digitization.

Annual, $ billions



Source: McKinsey partnered with the Aerospace Industries Association to study the digital maturity of the aerospace and defense industry. We assessed digital maturity through McKinsey's Digital Quotient, a benchmark of more than 25,000 respondents from 750 companies across 21 sectors.

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Agriculture

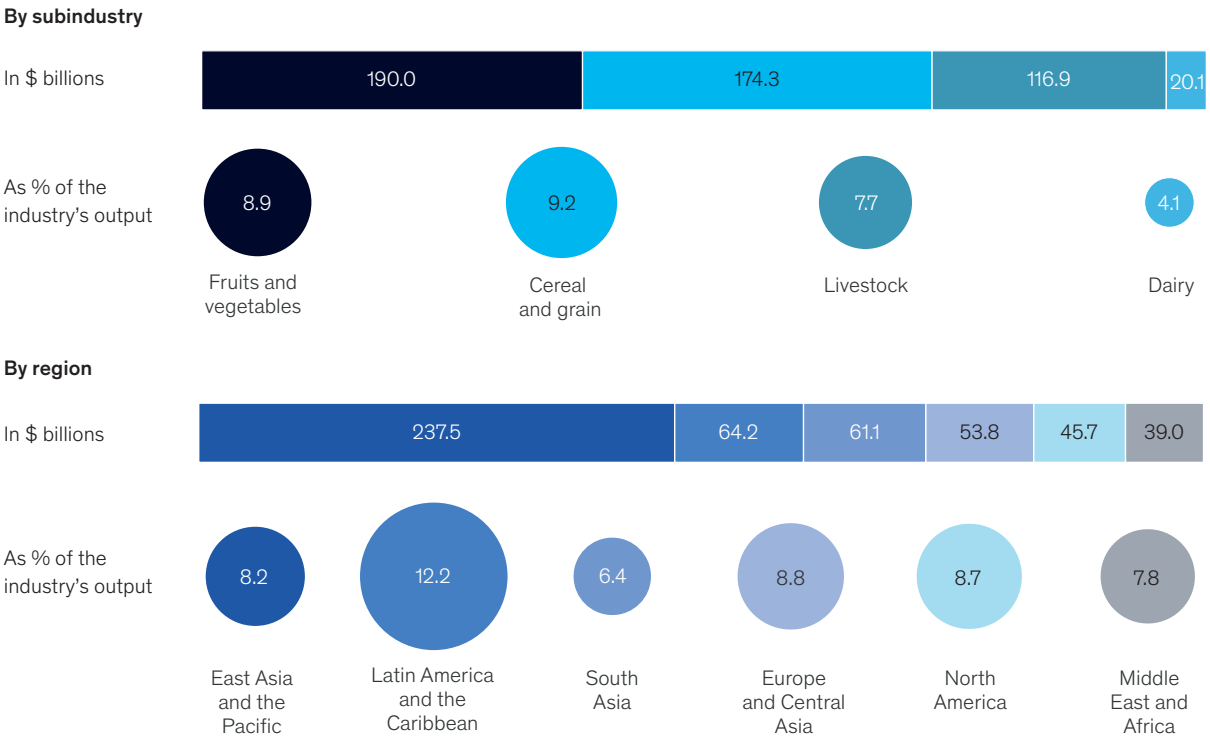
Agriculture's connected future: How technology can yield new growth

by Lutz Goedde, Joshua Katz, Alexandre Ménard, and Julien Revellat

Advances in machinery, crops, irrigation, and fertilizers have radically transformed farmers' yields over the past 50 years. Now, agriculture is on the cusp of a revolution in data and connectivity. Artificial intelligence, analytics, connected sensors, and other emerging technologies could further increase yields, improve the efficiency of water distribution and other inputs, and build sustainability and resilience across crop cultivation, including fruits and vegetables, and animal husbandry, including milk and dairy. If connectivity is implemented successfully in agriculture, the industry could add $500 billion in additional value to the global gross domestic product by 2030.

Agriculture connectivity could unlock more than $500 billion in GDP by 2030.

Distribution of potential value from connectivity in 2030



Source: McKinsey analysis

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Agriculture

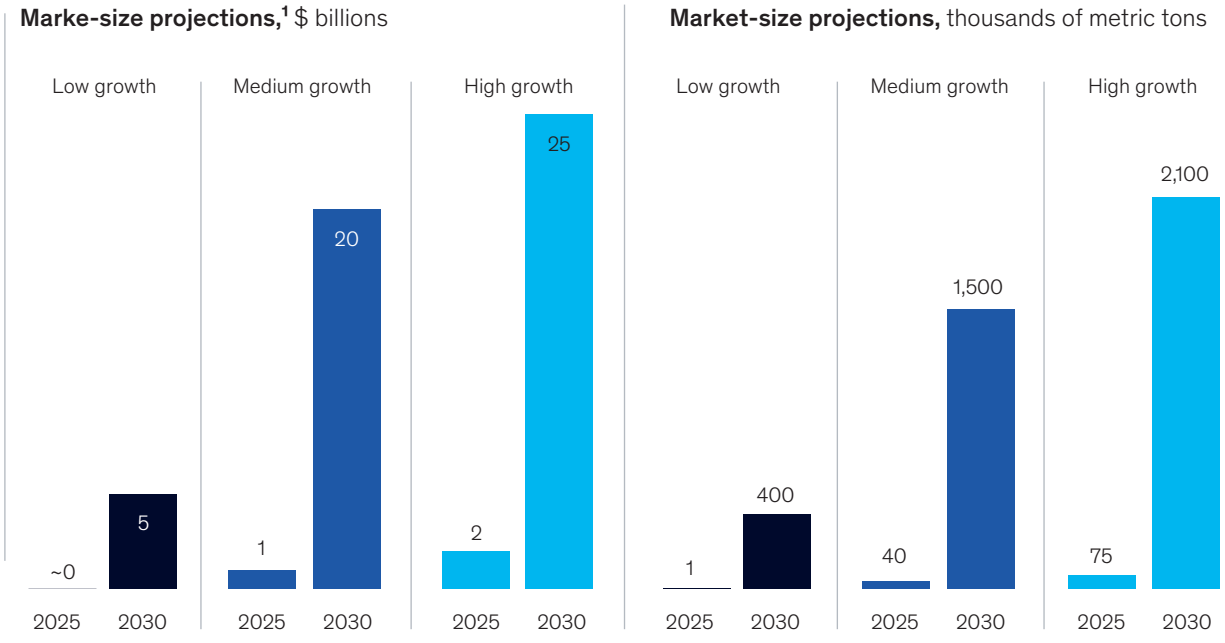
Cultivated meat requires investment to move to global scale

by Tom Brennan, Joshua Katz, Yossi Quint, and Boyd Spencer

Cultivated meat, made by replicating animal cells in a controlled environment, was little more than the dream of academic scientists a decade ago. However, in December 2020, consumers tasted it for the first time in Singapore, the first country to authorize it. The industry, which at present comprises fewer than 100 start-ups, has attracted roughly $350 million in investments in 2020 and about $250 million so far in 2021. The industry's next goal is to move from pilot scale to global scale, which will require investment in R&D, equipment, and inputs.

Depending on factors such as consumer acceptance and price, the market for cultivated meat could reach $25 billion by 2030.

Possible cultivated-meat market size



● **Low growth:** cultivated meat is only able to replace processed meat (eg, burgers, sausages), limiting penetration; sales geographically limited to North America, Europe, and select Asia–Pacific countries

● **Medium growth:** cultivated meat is able to replicate processed meat and whole cuts; sales geographically limited to North America, Europe, and select Asia–Pacific countries

● **High growth:** cultivated meat is able to replicate a wide variety of both processed meats and whole cuts; sales in multiple large meat-consuming countries and regions (eg, Brazil, China, EU, India, US)

[1]Manufacturing sales price.
Source: McKinsey analysis

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Automotive and assembly

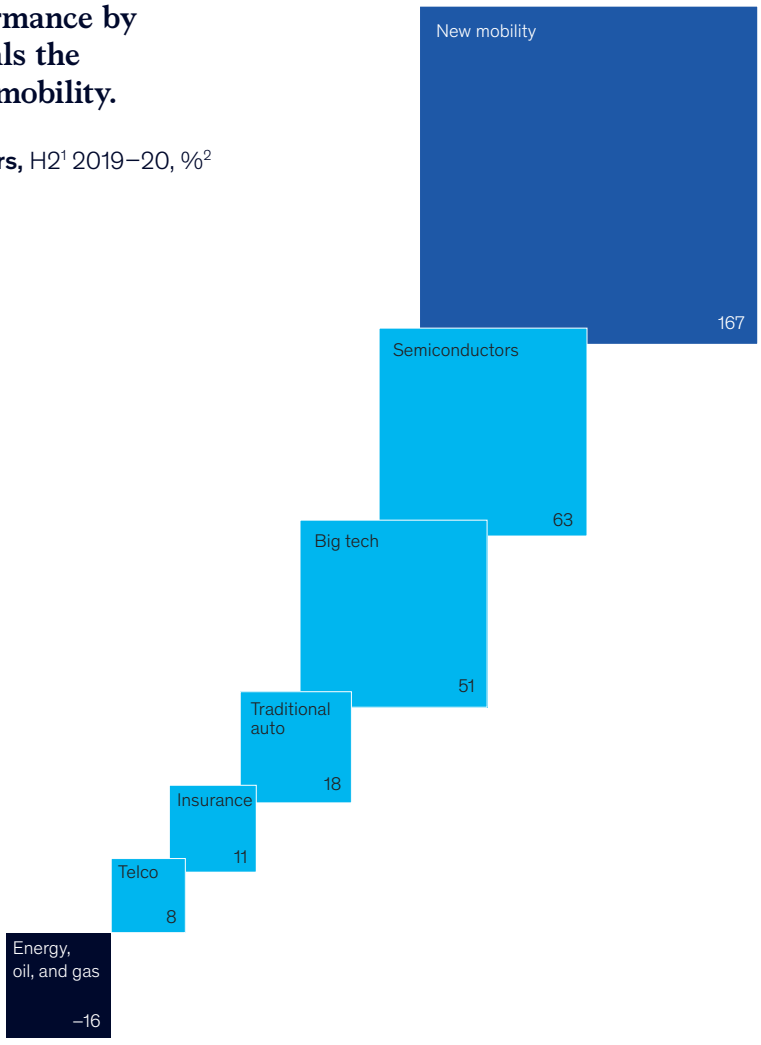
New mobility start-ups have been rewarded for getting sustainability, software, and new value pools right

by Kersten Heineke, Timo Möller, Asutosh Padhi, Dennis Schwedhelm, and Andreas Tschiesner

Over the past year and a half, the mobility industry has significantly outperformed top-performing industries in capital markets. New mobility start-ups are doing several things right, including focusing on sustainability, innovating in software and online car sales, and creating new value pools, such as shared mobility. Traditional auto companies will have to compete fiercely to capture a healthy portion of these new value pools. Whether those efforts are enough for capital markets to reward them, too, remains an open question.

Capital-market performance by industry cluster reveals the rapid growth of new mobility.

Total returns to shareholders, H2[1] 2019–20, %[2]



[1]Second half of fiscal year.
[2]Weighted average by market cap as of June 1, 2019.
Source: S&P Capital IQ; McKinsey analysis

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Capital projects and infrastructure

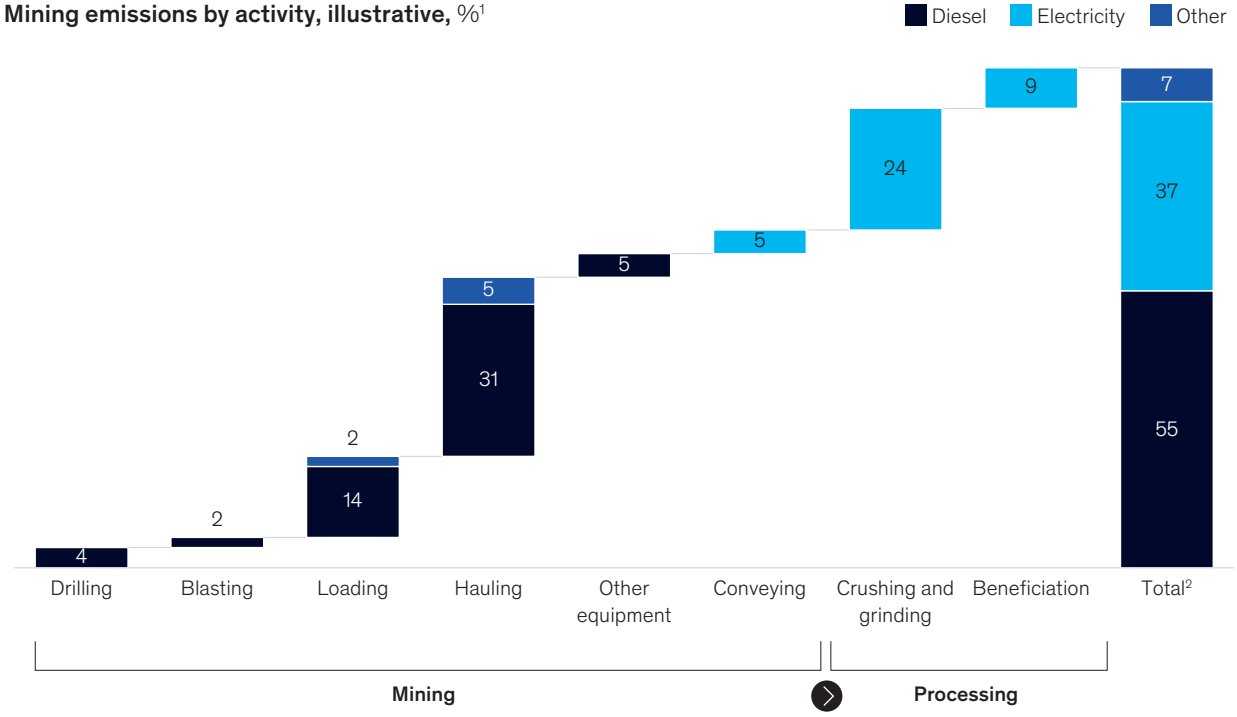
The zero-carbon mine is necessary, possible, and increasingly economical

by Henry Legge, Clemens Müller-Falcke, Tomas Nauclér, and Erik Östgren

The mining industry is at a tipping point regarding sustainability, which is increasingly a focus for capital markets. The cost of capital can be 20 to 25 percent higher for miners with the lowest environmental, social, and governance (ESG) scores. Encouragingly, our analysis shows that solutions to decarbonize the majority of emissions will become economically viable within this decade. To understand how this could work, we have created a mine-decarbonization model that assesses a variety of decarbonization options.

Addressing emissions from multiple sources is key to the decarbonization of mining.

Mining emissions by activity, illustrative, %[1]



[1]Example mine is an open-pit iron-ore mine in Australia with a run of 25 metric megatons per annum.
[2]Figures may not sum to 100%, because of rounding.
Source: McKinsey mine decarbonization model

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Consumer

A flush recovery for consumers?

by Susan Lund, Anu Madgavkar, Jan Mischke, and Jaana Remes

The massive shift toward digitization, automation, and hybrid work over the past year and a half has had a large impact on the way consumers shop, live, and work. But there's another way in which these innovations may change the consumer landscape: if companies continue to move forward with the bold actions they took during the COVID-19 crisis, they could boost annual productivity growth by one percentage point per year through 2024. We estimate this would add about $1,500 per capita in Spain and $3,500 per capita in the United States to GDP in 2024, with implications for consumers and the companies who serve them.

Our sector analysis indicates potential for incremental productivity growth of roughly one percentage point per year through 2024.

United States and Europe nonfarm business sectors

Sector	Share of economy, 2017,[1] %	Pandemic-related productivity acceleration potential, CAGR, 2019–24, %	Main contributors to potential productivity growth driven by COVID-19
Healthcare	10	1.6–3.0	• Telemedicine • Operational efficiency
Construction	5	1.7–2.5	• Operational efficiency • Industrialization • Digital construction
Retail	7	1.0–2.4	• E-commerce • Warehouse automation • Advanced analytics
ICT[2]	10	1.2–2.3	• Online channels • Online advertising • Demand for online services
Pharmaceutical[3]	2	0.8–2.3	• Digitization of sales channels • Automation of manufacturing • Artificial intelligence for vaccine discovery
Banking	8	0.9–2.0	• Hybrid working • Online channels • Shift to digital payments
Automotive[4]	3	0.4–1.2	• Electric vehicles • Connected cars • Online sales
Travel and logistics[5]	13	0.3–0.5	• Digital interaction (eg, apps) • Agile working • Automation of tasks
Other[6]	42	0.3–0.9	• Automation of tasks • Digital channels • Lower real-estate costs

Overall: 1.1

[1]Weighted by total nominal GDP contribution of the United States (62%) and six European economies (38%). Sectors included amount to 74% of the total economy in the United States and 75% of the total economies of the six European focus countries.
[2]Information and communications technology.
[3]Includes chemicals and pharmaceuticals manufacturing due to combined statistics for the United States and Sweden.
[4]Includes transport machinery.
[5]Includes arts and recreation, accommodation and food services, transportation and storage, other service activities, and activities of households and extraterritorial units.
[6]Includes professional services, wholesale, mining and quarrying, manufacturing (excluding automotive, chemicals, and pharmaceuticals), and utilities. Excludes public administration and defense, real-estate activities, education, and agriculture.
Source: EU KLEMS, European Commission, ec.europa.eu; McKinsey Global Institute analysis

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Consumer

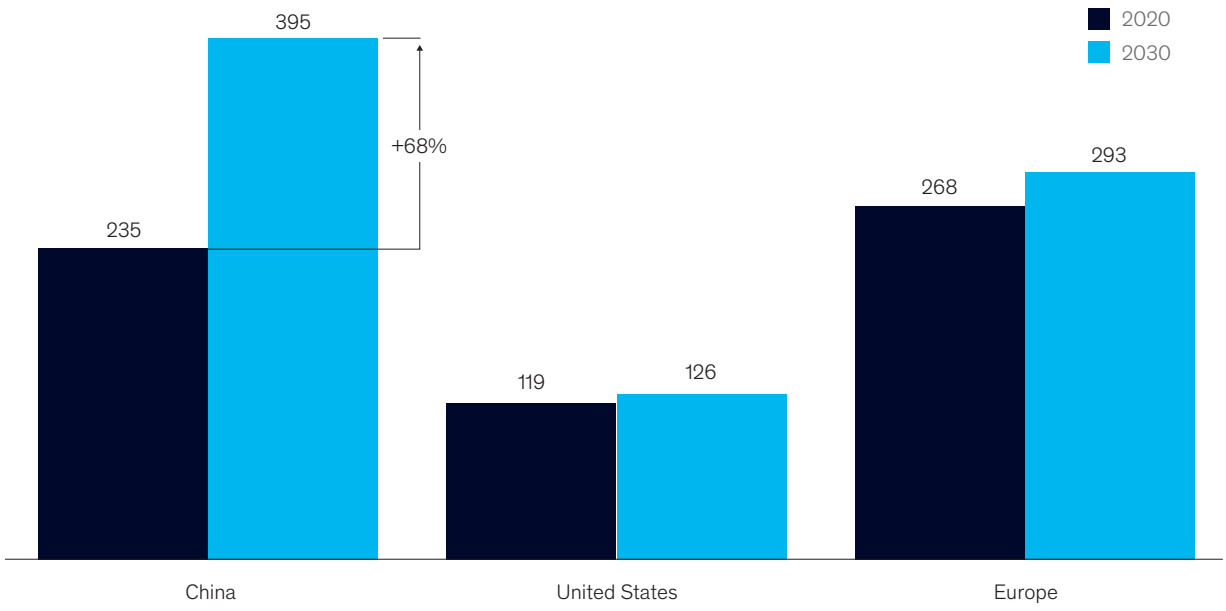
A huge new upper-middle class will emerge in China over the next decade

by Jeongmin Seong, Jonathan Woetzel, and Daniel Zipser

China offers a $5 trillion consumption-growth opportunity over the next decade. Within ten years, China could account for almost as many households of upper-middle income and above as Europe and the United States combined. Chinese consumers are increasingly digitally native and concerned about the environment; live in smaller, urban households; and are willing to spend on domestic tourism and sharing platforms. The sheer scale of China's consumer markets and rising incomes remain key considerations for consumer-facing companies, but they also need to learn how to serve markets that are changing socially, demographically, and technologically.

Over the next decade the number of households with upper-middle income and above in China is expected to grow by almost 70 percent.

# of households with upper-middle income and above,[1] millions



[1] Annual income of $22,000 or more; adjusted to 2011 international purchasing power parity.
Note: Projections based on McKinsey's baseline scenario, which assumes that the long-term growth trajectory of China, Europe, and the United States is not materially affected by the pandemic. Growth outcomes will depend on the shape of the recovery from the pandemic and other macroeconomic factors in different geographies.
Source: McKinsey Global Institute analysis

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Electric power and natural gas

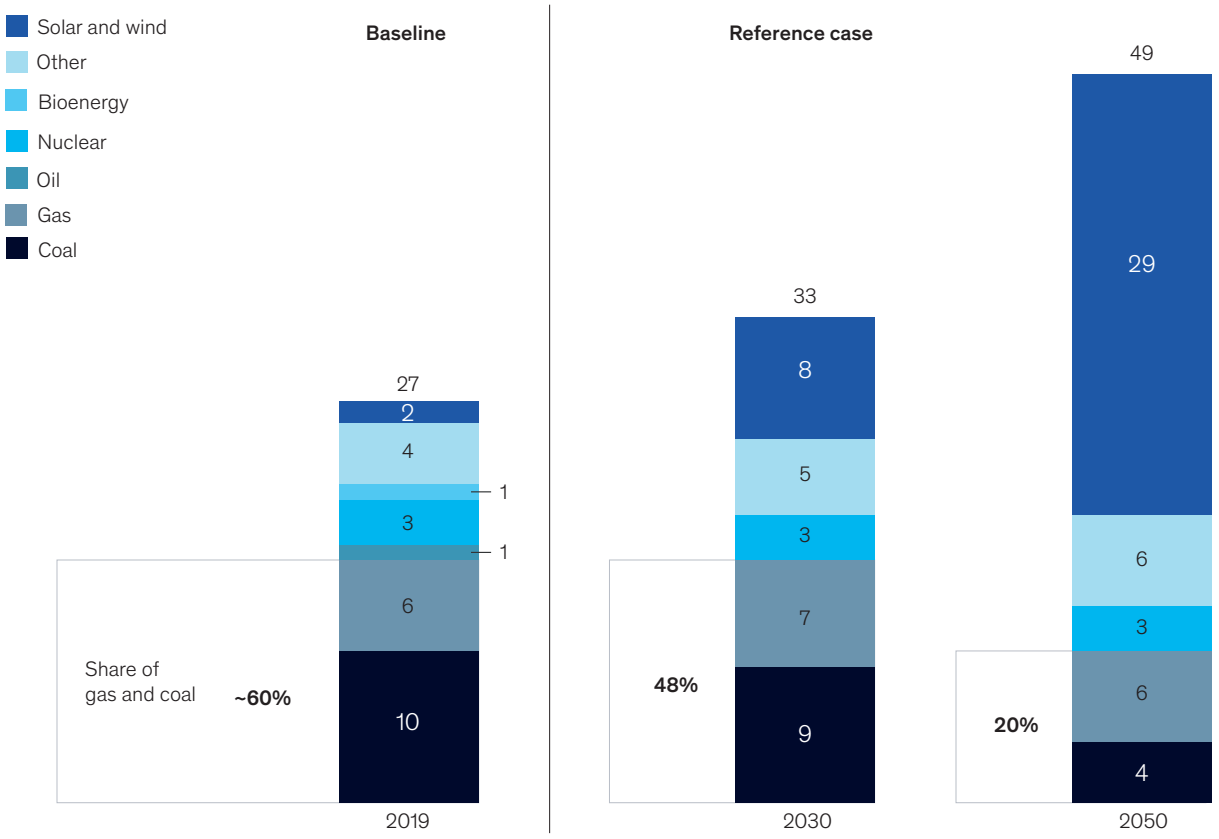
Power companies can create value by modernizing existing plants.

by Harold Janin, Jochen Latz, Katsuhiro Sato, and Benjamin Sauer

Simply put, power companies are not nearly as advanced as they could be, which means that operational and maintenance costs could potentially be much lower. Further complicating matters, cost pressure for thermal assets—namely, coal and gas—continues to rise because of ongoing power-market liberalization and large-scale deployment of renewable energy sources. Tech-enabled transformation that combines new technologies with traditional improvement can create significant value. In an illustration of the dynamic situation, Europe is currently in the midst of a natural gas shortage that has hit industry and consumers with huge price increases.

Coal and gas still dominate power generation—and will likely continue to do so through 2030.

Global power generation mix, petawatt-hour (PWh)



Note: Figures may not sum to totals, because of rounding.
Source: McKinsey Global Energy Perspectives; McKinsey 1.5°C scenario analysis

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Engineering, construction, and building materials

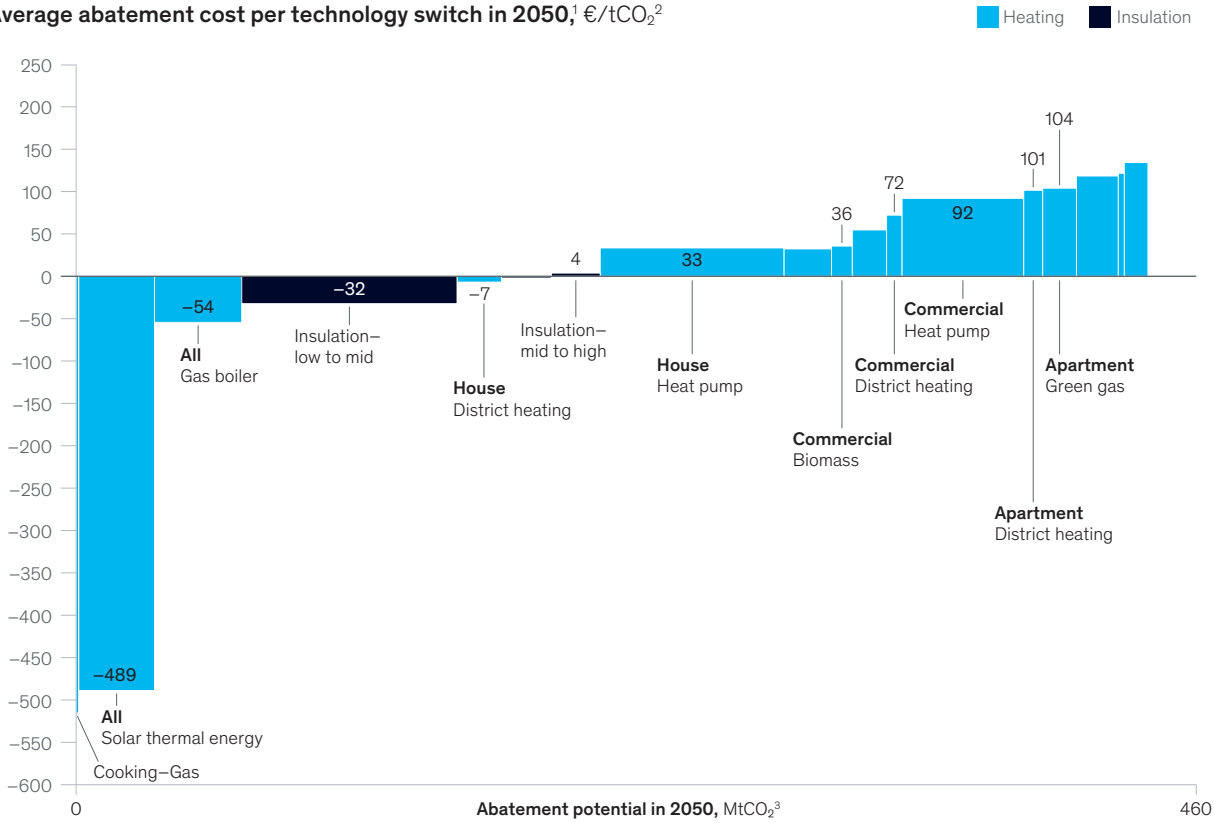
Existing buildings need retrofitting to meet decarbonization targets.

by Jose Luis Blanco, Hauke Engel, Focko Imhorst, Maria João Ribeirinho, and Erik Sjödin

Construction is directly or indirectly responsible for 25 percent of global greenhouse-gas emissions. About 30 percent of emissions derive from material processing (largely cement and steel), while the other 70 percent come from building operations. With roughly 80 percent of the building stock predicted for 2050 already in existence, there is a huge need for retrofitting. The good news is that there are clear actions that can dramatically reduce the industry's carbon footprint—and many will also deliver cost savings.

Switching to solar thermal energy and medium insulation in existing stock is a no-regrets move to reduce emissions from heating.

Average abatement cost per technology switch in 2050,[1] €/tCO_2[2]

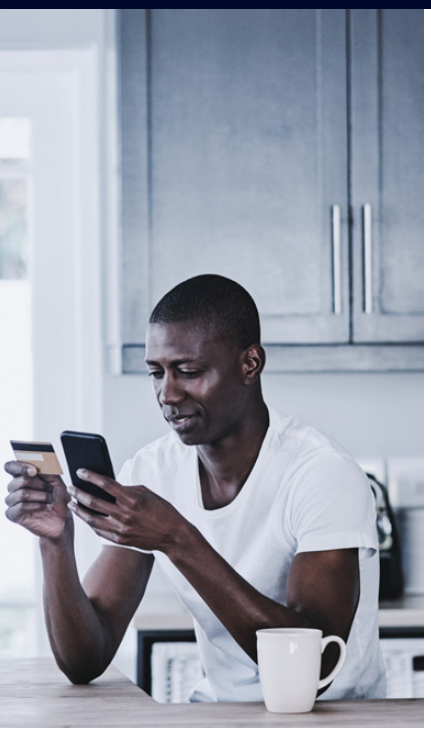


[1]The labeled costs are aggregated for the eventual technology. Switches between technologies originate from multiple other technologies. The relatively low reduction from district heating is due to a relatively high baseline (compared to heat pumps) and a large number of switches from gas boilers to district heating. Although natural gas is not carbon neutral, a temporary change to gas is foreseen when replacing oil- or coal-based heating.

[2]Metric tons carbon dioxide.

[3]Metric megatons carbon dioxide.

Source: *CO_2 emissions from fuel combustion 2018*, International Energy Agency, 2018, oecd-ilibrary.org; OECD



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Financial services

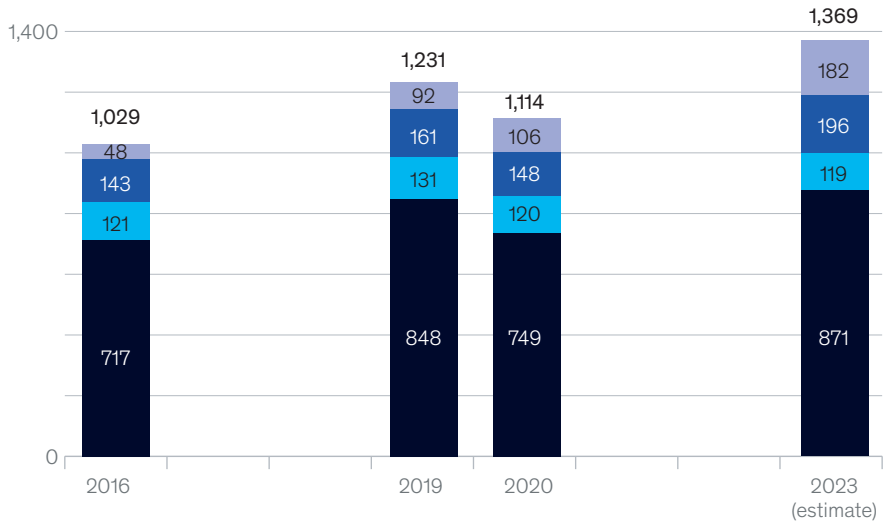
Buy now, pay later: A small but rapidly growing new competitor to traditional unsecured lending

by Puneet Dikshit, Diana Goldshtein, Blazej Karwowski, Udai Kaura, and Felicia Tan

Financing at the point of sale may be a small share of unsecured lending in the United States today, but it's growing fast. Thus far, fintech companies have taken the lead, diverting $8 billion to $10 billion in annual revenues away from banks. Banks seeking long-term growth would be wise to explore market entry, and merchants should considering reassessing their financing offers.

Point-of-sale financing is growing faster than other unsecured lending—a trend likely to continue.

Outstanding balances for unsecured lending products,[1] $ billions



CAGR,[2] 2020–23, %

- 18 to 20 — *Point-of-sale financing*
- 8 to 10 — *Personal loans*
- –2 to 0 — *Private-label credit cards*
- 5 to 6 — *General-purpose credit cards*

[1]Includes all consumer and small-business credit cards, installment-based products offered at point of sale, and personal loans. Excludes overdrafts and student loans.
[2]Compound annual growth rate.
Source: Federal Reserve; TransUnion; McKinsey consumer finance pools

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Healthcare systems and services

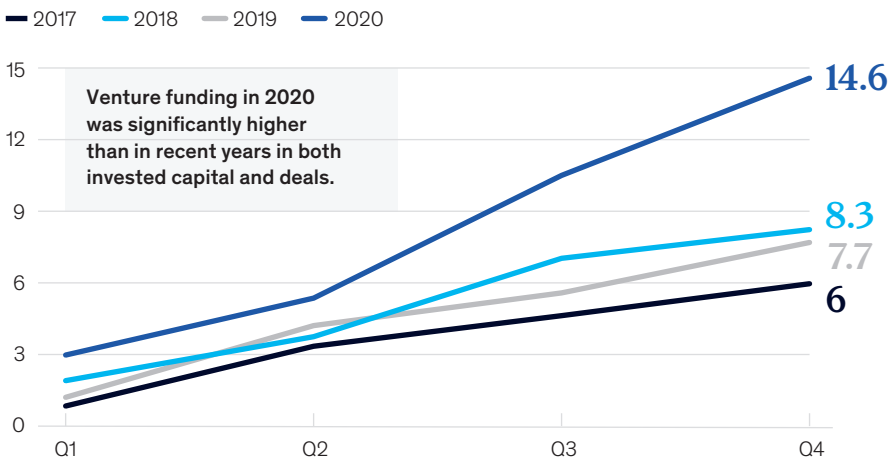
The pandemic turbocharged telehealth. Companies should capitalize on its momentum

by Oleg Bestsennyy, Greg Gilbert, Alex Harris, and Jennifer Rost

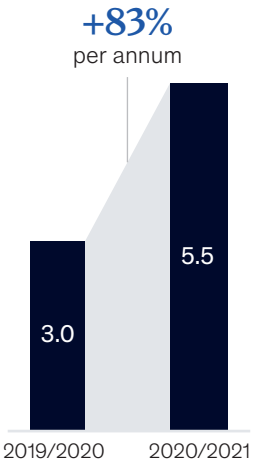
As of July 2021, telehealth utilization was 38 times higher than it was before the pandemic. Investment in virtual care and digital health more broadly has also skyrocketed, with three times more venture-capital investment in digital health last year than in 2017. As investment in virtual health companies continues to grow at record levels, so does the pressure on the companies within the ecosystem to innovate and to find winning models in this quickly evolving space.

Both investment in digital health and the revenues of telehealth players have almost doubled since 2019.

Total venture funding for digital health companies by year, $ billions



Total annual revenues, $ billions



Source: Adriana Krasniansky et al., "H1 2021 digital health funding: Another blockbuster year. . . in six months," Rock Health, July 2021, rockhealth.com; McKinsey virtual health vendor database

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Oil and gas

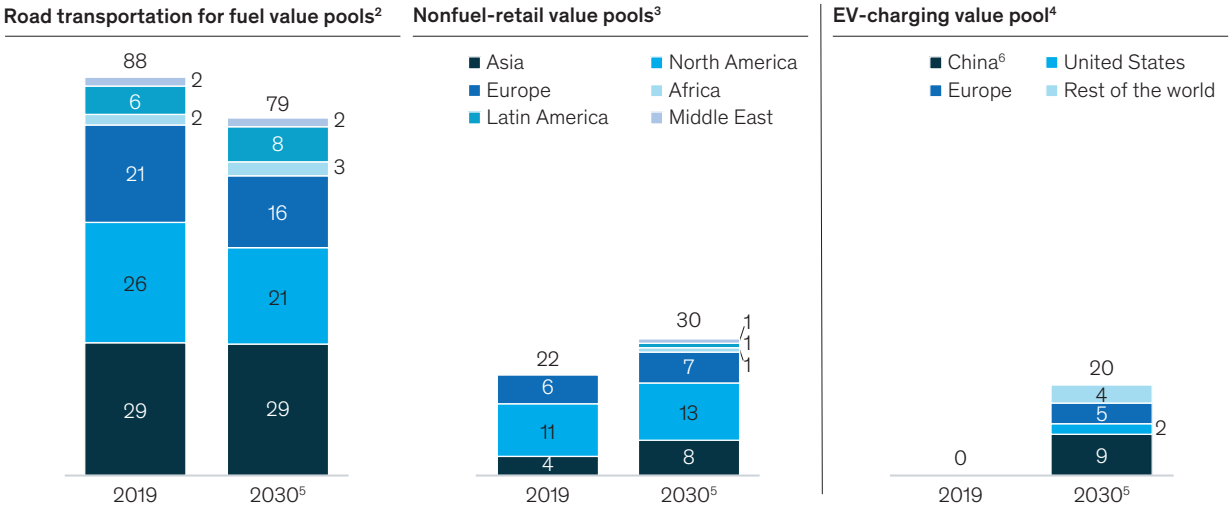
Electric-vehicle charging and nonfuel sales represent opportunities for retailers who get trends right

by Álvaro Bau, Arjun Chopra, Mladen Fruk, Lazar Krstić, Klaas Mantel, and Florian Nägele

Nonfuel retail can continue to offer attractive returns, particularly for retailers who successfully execute a comprehensive electric-vehicle charging strategy. Nonfuel consumption is likely to move away from tobacco, sugary drinks, and salty snacks, although milk, diapers, and other basics remain significant parts of nonfuel offerings. Fuel retailers need to think about developing their forecourts into destinations for fresh-food shopping, click and collect, pharmacy purchases, postal services, and other services that dovetail with consumer trends.

Developing markets and nonfuel retail are growing, while e-mobility is an emerging value pool.

Net value pools, EBITDA[1] equivalent, $ billions



Note: Figures may not sum to totals, because of rounding.
[1]Earnings before interest, taxes, depreciation, and amortization.
[2]Includes B2C (passenger vehicles and two- and three-wheelers) and B2B (passenger-vehicle fleets, light commercial vehicles, buses, and trucks).
[3]Includes forecourt convenience and car wash.
[4]Electric vehicle. This is a nascent and uncertain market requiring significant investment, and its eventual value could differ significantly from this projection. Use cases include home, work, destination, fleet, and on-the-go charging, but not two-wheeler charging.
[5]2030 projections are based on the McKinsey muted virus recovery scenario.
[6]Assuming no cap on tariffs for public charging, allowing private players to set tariffs.
Source: McKinsey energy insights value pool model

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Life sciences

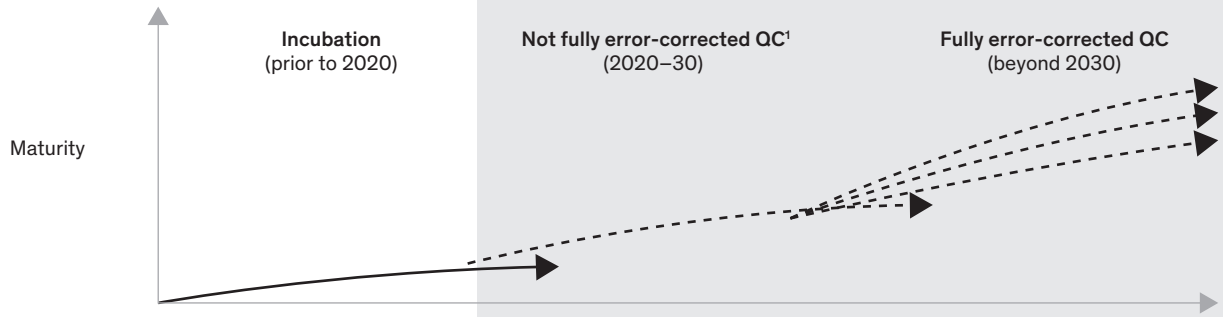
Quantum computing can accelerate drug discovery for firms that prepare for its potential

by Matthias Evers, Anna Heid, and Ivan Ostojic

The ability of quantum computing (QC) to simulate complex molecules could be game changing for drug innovators. QC is expected to be able to predict and simulate the structure, properties, and reactivity of molecules more effectively than conventional computing can, significantly improving the early steps of drug discovery. Pharmaceutical companies should assess QC now and lay the groundwork to reap the benefits of the technology later.

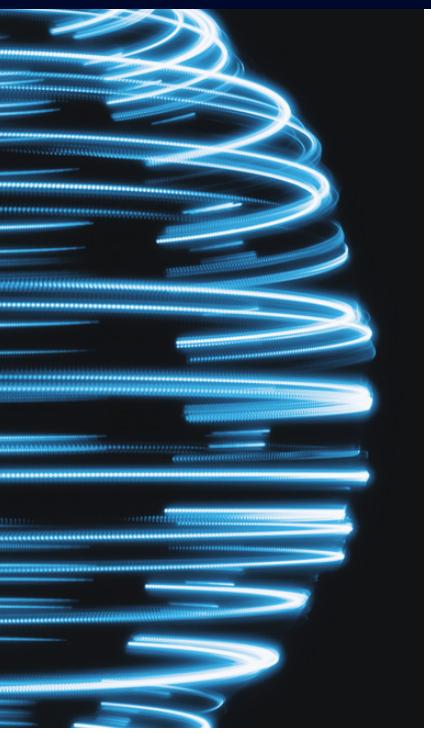
Value creation through quantum computing in the pharmaceuticals industry is expected to start by 2030.

Evolution of quantum computing (QC)



	1	2	3
Key activities	Fundamental research and technology development • Academic and early commercial R&D activities • Disruptive changes • Emergence of quantum-inspired algorithms	Commercialization wherever QC can bring early value • Commercial R&D and business development • Disruptive and incremental changes	Full value creation and commercialization of QC for multiple problems • Upscale and rollout to serve late adopters • Dominance of incremental changes
Source of funding	Only governments or pioneers invest	QC is financed by corporate R&D budgets, venture capital, and governments	Value-based pricing

[1] Not fully error-corrected QC is often referred to as "noisy intermediate-scale quantum" (NISQ). This phase describes the not-error-corrected characteristics of near-term devices that are based on an initially considerable number of quantum bits (qubits) to solve problems classic computers can't solve yet and do not provide fault tolerance.



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Retail

The recent winners in retail were best positioned to benefit from the pandemic-inspired flight to online sales

by Chris Bradley, Sajal Kohli, Dymfke Kuijpers, and Thomas Rüdiger Smith

During the COVID-19 pandemic, 90 percent of market-cap gains in retail have accrued to 25 companies. These are primarily highly capitalized, tech-forward, asset-light businesses in four categories: home-economy players, value retailers, online specialists, and platform players. Most of the shifts in retail over the past year were evident to keen industry observers before the pandemic hit; the pandemic merely put the sector's gradual transition into overdrive.

The retail industry has seen a huge shift of value to online.

Market capitalization,[1] $ billions

[1] As of April 29, 2021.
Source: Corporate Performance Analytics; S&P Global

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Travel, transportation, and logistics

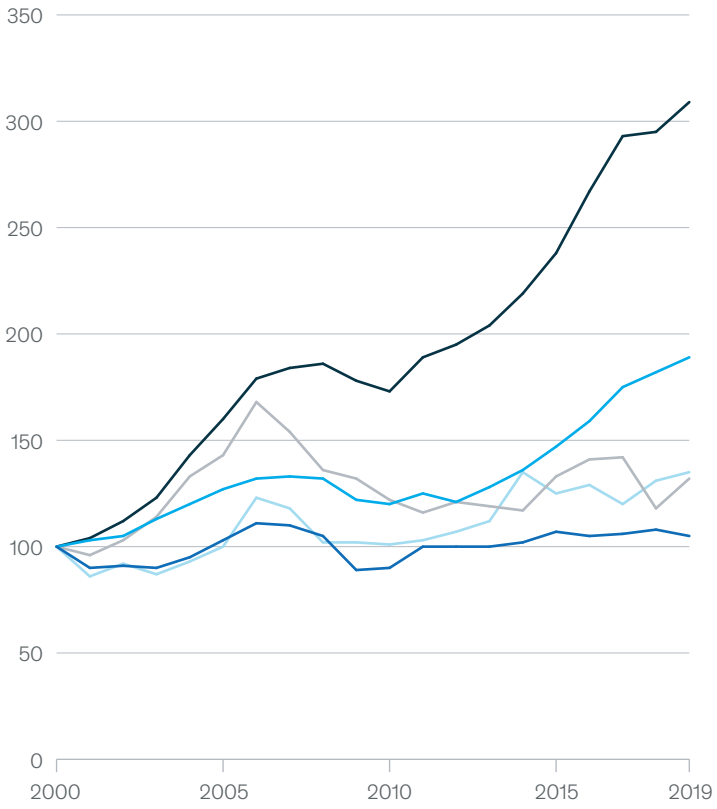
A travel boom is looming, but some pandemic-era changes could last for a long time

by Jaap Bouwer, Vik Krishnan, Darren Rivas, Steve Saxon, and Nina Wittkamp

Call it "revenge travel": after living through a crisis, people crave vacations and want to visit loved ones. Business travel, on the other hand, has historically been much slower to recover after a crisis and, this time, may be permanently altered by the wide adoption of videoconferencing. Hotels will need to find new purposes for meeting and conference spaces, and airlines will have to figure out how to fill intercontinental business-class seats, likely with premium leisure promotions.

Business travel usually takes the longest to recover after economic crises—if it fully recovers at all.

International flights to and from the United Kingdom by purpose, %, indexed to 2000



Time to reach precrisis levels, years

	9/11	Global financial crisis of 2008
Visits to friends and relatives	0	3
Vacation	0	6
Study	4	6
Miscellaneous	0	Not yet recovered
Business	4	Not yet recovered

Source: Travelpac: Travel to and from the UK, UK Office for National Statistics, ons.gov.uk