

# The Long View

Investment Insights

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# Investing in U.S. Innovation



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**“The innovation and entrepreneurial spirit in this country is remarkable.”**

**Mike Kerr**, Portfolio Manager

The United States’ economy is in the midst of an extraordinary transformation, one that has the power to redefine America’s future. Across the country, the nation’s resilience in the face of adversity and its entrepreneurial spirit are providing unprecedented opportunities for companies and investors.

The U.S. and its economy, of course, are by no means perfect. The recovery from the Great Recession has, at times, seemed sluggish. There’s infrastructure that needs to be rebuilt, wage growth has been slow, and the nation’s politics can be divisive, especially during an election year. For investors, the volatility in the market has on occasion been nerve-wracking.

Still, the U.S. has one of the most diverse, dynamic and resilient economies in history. Since the Great Recession, the economy has steadily expanded and the U.S. now has a gross domestic product of nearly \$18 trillion, or about 25% higher than its 2009 level during the financial crisis.

“The variety of ways people make a living in this country is incredible,” portfolio manager Mike Kerr says. “The diversity of our economy and how many layers it has makes the U.S. economy the envy of the world.”

Indeed, across the nation, companies, universities and individuals are coming up with new ideas that are changing the way people live and new products that are boosting bottom lines.

“I think the technologies of the future, the industries of the future, are more likely to come out of the United States than anywhere else in the world,” Mike says.

That technological and industrial leadership is underpinned by a long line of entrepreneurs who have been willing to take risks, a characteristic that’s made the U.S. the most innovative economy in the world. That can-do attitude and the country’s reputation as the land of opportunity continues to attract the best and brightest from around the world.

The nation’s higher education system remains one of the strongest building blocks of the economy. Schools in the U.S. accounted for six out of the top 10 universities in the world, according to the Times Higher Education World University Rankings, and 63 of the top 200.

Many of those universities are now part of a dynamic system, working with corporations and government agencies, a triad that’s bolstered another strength of the nation – research and development (R&D).

Here again, the U.S. leads the world, with investment in R&D expected to reach \$514 billion in 2016.

“We have pools of money to invest in the future,” Mike says. “And we have a skill set of investing in the future that’s unlike anywhere else in the world.”

## Key Takeaways

### Investing in U.S. Innovation

- The United States’ economy – one of the most resilient and dynamic in the world – has grown 25% since the Great Recession.
- Innovation and technological advances have kept the country on the cutting edge of change and spawned new businesses that few could have imagined a decade ago.
- Companies that are poised to take advantage of these changes have the potential to reap new profits, and provide investors new opportunities.

Investments are not FDIC-insured, nor are they deposits of or guaranteed by a bank or any other entity, so they may lose value.

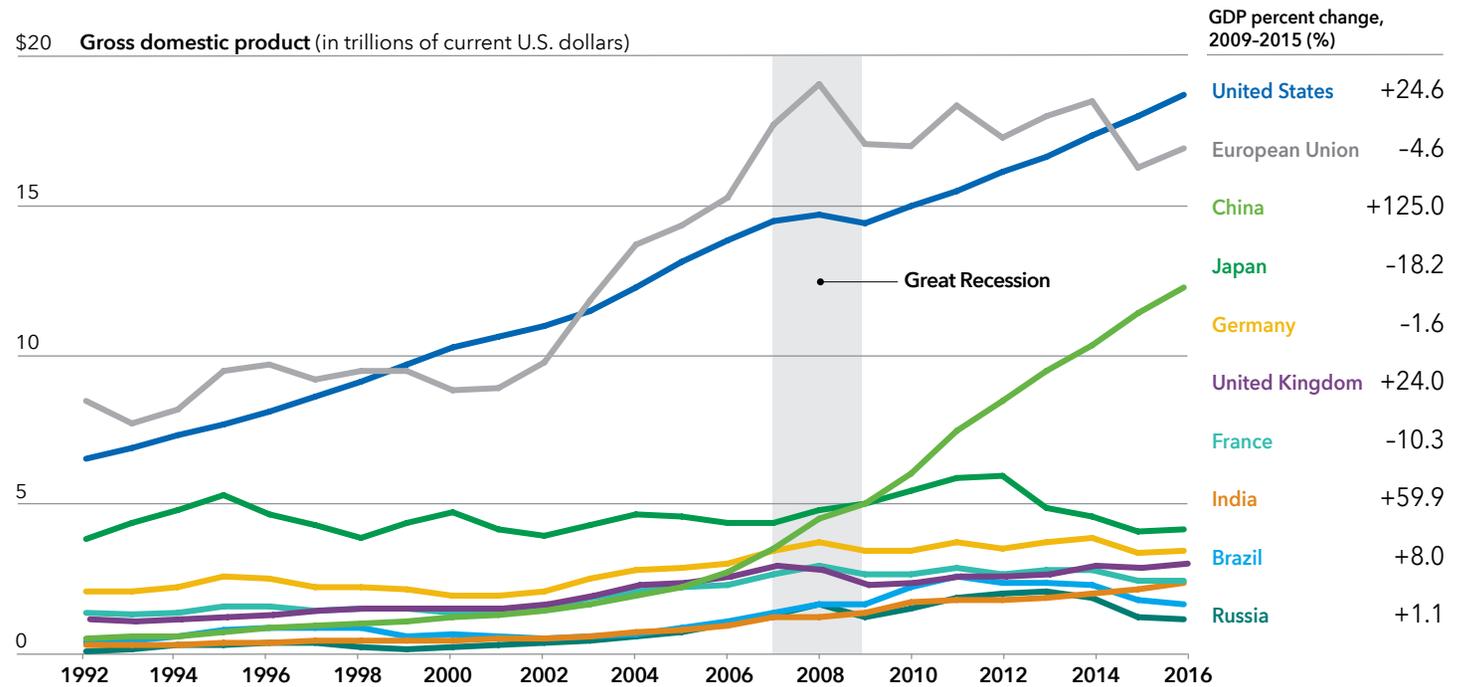
Past results are not predictive of results in future periods.

# A Heavyweight Economy Built to Go the Distance

Despite Challenges, the U.S. Economy Continues to Expand

“For 240 years it’s been a terrible mistake to bet against America, and now is no time to start.”

Warren Buffett, CEO Berkshire Hathaway



Source: Thomson Reuters. Values are based on gross domestic product in national currency converted to U.S. dollars using market exchange rates (yearly average). Data for 2015 and 2016 are estimates. Please see back cover for additional information.

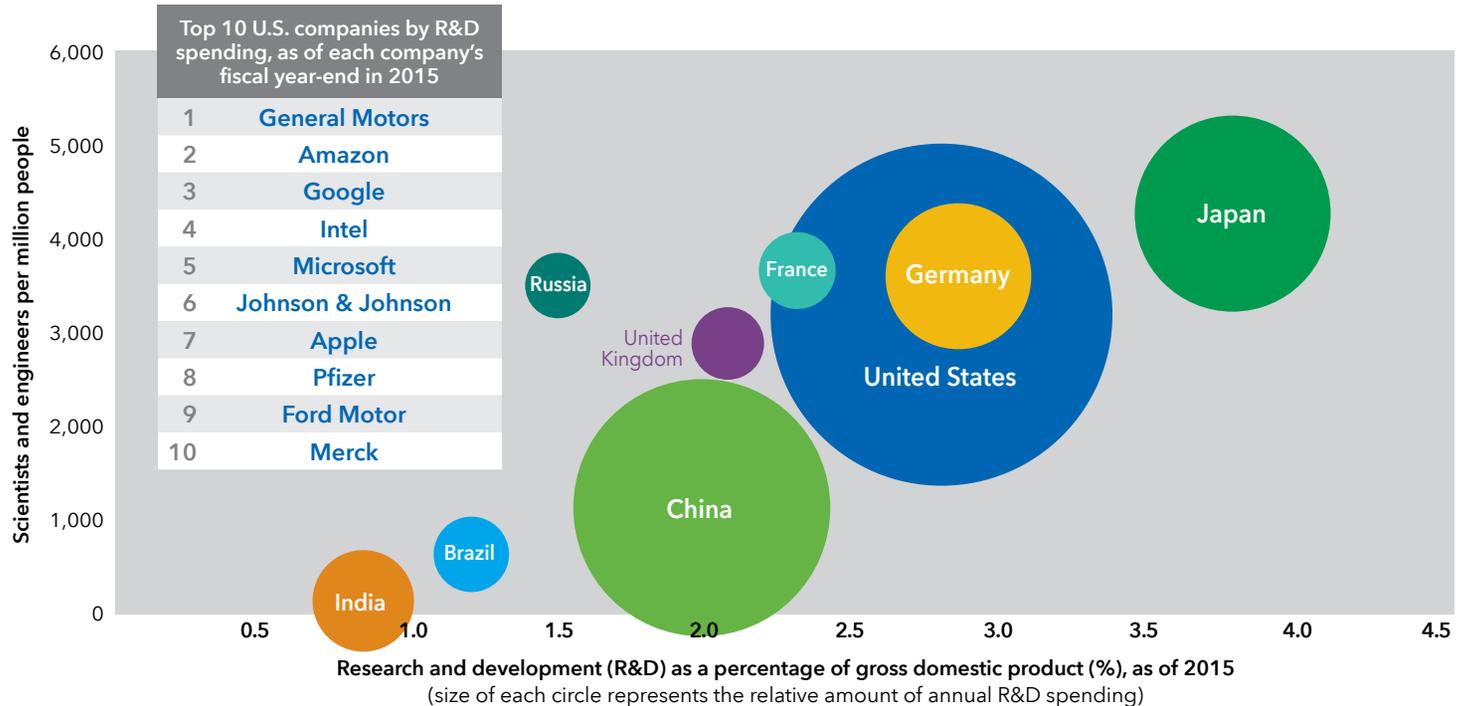
- The recovery from the Great Recession seems as if it’s been frustratingly slow, especially in an economy that has a history of relatively quick recoveries from recessions. But feelings may be getting in the way of facts when it comes to economic growth. Indeed, the U.S. economy is now larger than it was at its peak before the recession. In 2015, the nation’s gross domestic product was an estimated \$18 trillion, or nearly 25% higher than its 2009 level of \$14.4 trillion during the financial crisis.
- While the economic recovery has not been speedy or steep, it has been consistent. After experiencing a decline that ranks as the worst since World War II, the U.S. economy has grown in all but two of the last 26 quarters. For much of the time, wage growth has been slow and the housing and automobile sectors have lagged. But those sectors have demonstrated their resilience and are now contributing to the nation’s economy. In fact, U.S. auto sales hit a record of 17.5 million vehicles in 2015.
- This remains a challenging environment for the economy. But the U.S. economy is resilient, and remains the world’s largest single-country economy (China is second, with \$11.4 trillion GDP). The U.S. economy now accounts for nearly a quarter of global GDP, even though it has only 4.4% of the population, and the U.S. is likely to continue to have an outsize role in the global economy. The International Monetary Fund projects that U.S. GDP will reach \$22 trillion in 2020.

# The U.S. Leads the World in R&D Spending

From Cars to Computers, R&D Has Helped Turn Concepts Into Cash

“In more and more industries, the speed with which changes happen now essentially demands that companies adapt to new competitive environments in order to thrive and prosper.”

Claudia Huntington, Portfolio Manager



Sources: 2016 Global R&D Funding Forecast, Winter 2016, R&D Magazine, Advantage Business Media and Industrial Research Institute (R&D as a percentage of GDP); FactSet Data Systems/Reuters Global Fundamentals (top 10 U.S. companies by R&D spending). Please see back cover for additional information.

- The United States, which leads the world in spending on research and development, is expected to increase R&D spending 3.4% to \$514 billion in 2016. That's about 2.8% of the nation's gross domestic product. While R&D funding isn't the sole indicator of how a nation or industry will perform, the creation of new products, processes and technologies is one of the fundamental factors. Indeed, R&D can be one of the drivers of economic growth and corporate success.
- The federal government and academia spend significant amounts on R&D, but industry is by far the biggest contributor, spending about \$357 billion, or approximately 70% of the U.S. total. Many of the biggest spenders on R&D in the U.S. are in the technology sector, including Intel, Google and Microsoft. In the auto sector, Ford and General Motors spent about \$7 billion each in 2015, with the drive toward electric cars fueling much of the spending. Pharmaceutical companies are also big R&D spenders.
- Worldwide, about \$1.95 trillion is expected to be spent on R&D in 2016, up from \$1.8 trillion in 2014. While the U.S. leads in spending, much of the growth in global R&D investments is being driven by spending in Asia, especially China. China is the world's second-largest investor in R&D with a forecast spending of \$396 billion for 2016. Asian countries (including China, Japan, India and South Korea) now account for more than 40% of all global R&D investment.

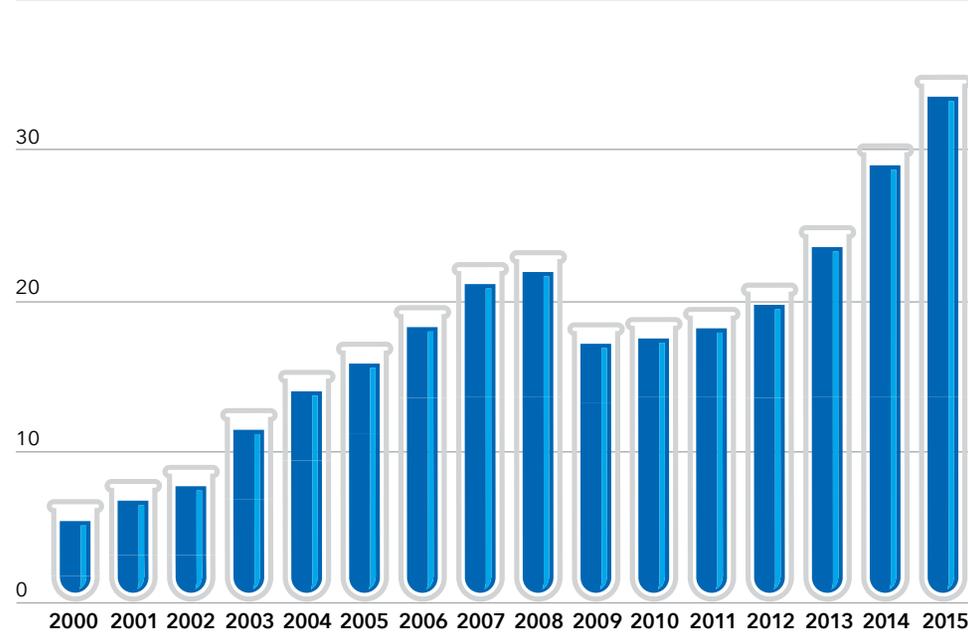
# Biologics: The U.S. Is a World Leader in Biotechnology Drugs

Massive R&D Spending Has Helped Launch a New Era in Medicine

“I think there are a number of companies that may be on the verge of delivering innovative and potentially disruptive technologies to treat unmet medical needs. We may now be in a development cycle that could prove to be very long-lived.”

Hilda Applbaum, Portfolio Manager

\$40 U.S. biotechnology companies research and development expenditures (billions)



Top 10 biotechnology companies worldwide, based on market capitalization, as of February 29, 2016

1	Gilead	
2	Amgen	
3	Celgene	
4	Biogen	
5	Regeneron	
6	CSL	
7	Alexion	
8	Baxalta	
9	Illumina	
10	Vertex	

Sources: Ernst & Young (U.S. biotech companies R&D expenditures) and FactSet Fundamentals (top 10 biotech companies worldwide). R&D expenditure data for 2014 and 2015 are estimates. Top 10 companies are based on the most recent data available at the time of publication.

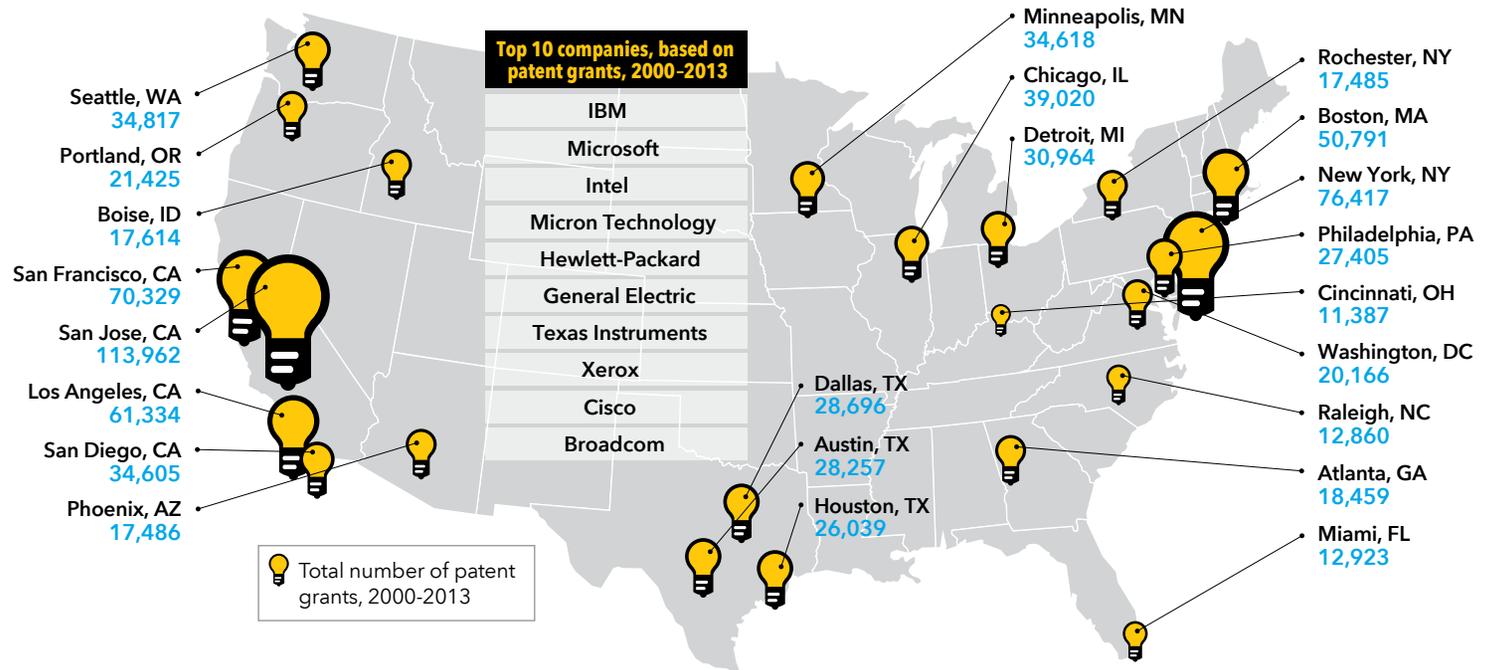
- When it comes to biopharmaceutical firms, the old saying is true – you’ve got to spend money to make money. In 2015, biopharma firms in the U.S. spent about \$33 billion on research and development, or the bulk of the \$51 billion spent by the entire pharmaceutical industry. The biopharmaceutical sector’s significant investments in R&D have helped drive its contributions to the U.S. economy and allowed it to be a world leader in the development of new medicines.
- R&D spending has helped create a host of biotechnology drugs, or biologics, that can slow the progression of a disease or, in some cases, cure a condition outright. Biologics are incredibly complex drugs, some derived from human genes. In 2014, the top 10 selling biologics accounted for \$73 billion in revenue for companies such as Amgen and Biogen. HUMIRA®, an injectable drug made by AbbVie that’s used to treat rheumatoid arthritis, topped the list with \$12.5 billion in sales.
- The United States leads the way in the development of biologics, and is home to most of the world’s largest biopharma companies, such as Gilead and Amgen. These and other companies are developing therapies that are helping fight the war on cancer. Because the barriers to entry are so high in this arena, a successful biologic represents a long-term and unusually secure source of recurring revenue for the manufacturer. And that cash flow, in some cases, is being used to reward investors with dividends.

# The Innovation Nation

From Coast to Coast, U.S. Cities Are on the Cutting Edge of Change

“The U.S. is one of the major innovation engines of the world. This is what gives U.S. companies a significant strategic edge.”

Alan Berro, Portfolio Manager



Source: United States Patent and Trademark Office (USPTO), [www.uspto.gov](http://www.uspto.gov). Cities shown are those with a total of more than 10,000 patent grants for the stated period. Please see back cover for additional information.

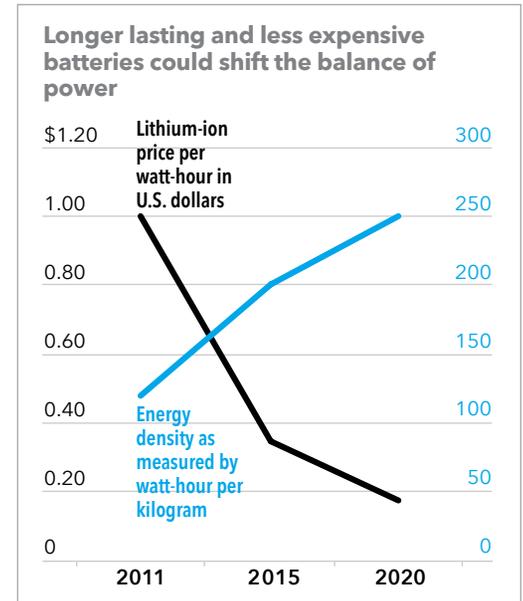
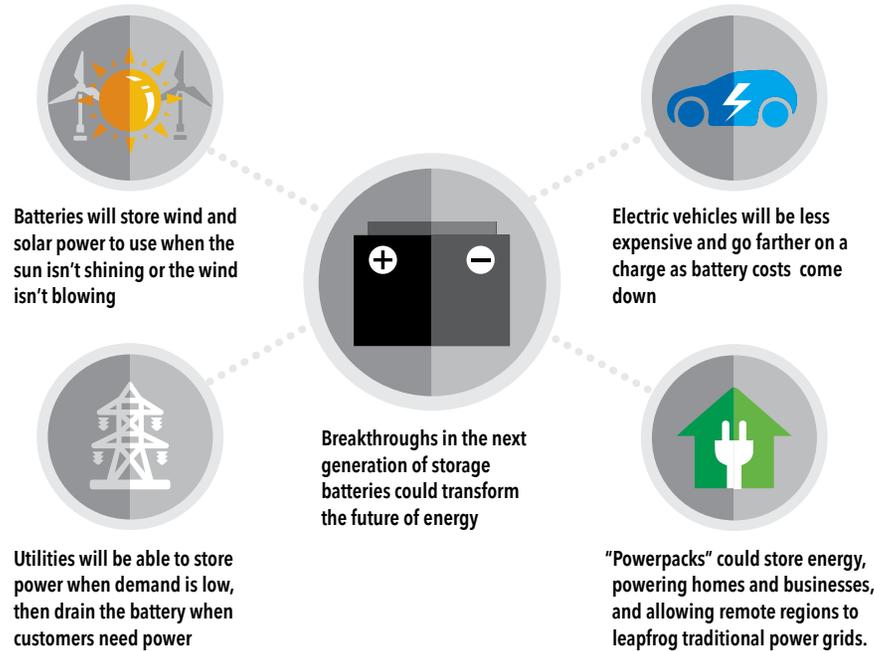
- Top universities, tons of venture capital, hot startup companies – when it comes to innovation, is there anything the Bay Area doesn’t have? As fertile as the City by the Bay and the Silicon Valley are when it comes to cutting-edge ideas and products, there is one thing Northern California lacks – a lock on good ideas. From the Twin Cities to Austin to Atlanta, the United States is a veritable idea factory, a nation with a “disruptive-innovation” mindset and the resources to turn concepts into cash.
- In fact, several regions are becoming innovation hubs and drawing a new generation of inventors and investors. Austin, for example, seems to attract influential tech talent from around the nation and the globe. Notable companies like HomeAway, Indeed and Gowalla all got their scrappy starts in the city and a new Austin-based startup is making headlines on an almost daily basis. Indeed, funding for Austin startups surpassed \$993 million in 2014, a 123% increase from the previous year.
- Innovation is occurring across the nation. In Oregon, Nike, the footwear and apparel giant, received 554 patents in 2013. Minnesota’s Medical Alley is a renowned hotspot for health technology innovation, as well as a global destination for investment. The pacemaker, mechanical heart valve and hearing aid all originated in Minneapolis. From Seattle to Miami, innovative companies are coming up with new products, profit opportunities and, potentially, rewards for investors.

# Charging Ahead: Is a Better Battery the Next Big Thing?

The Race Is on to Reduce the Cost of Batteries and Increase Storage Capacity

“If we ever solve storage and batteries, the world changes – for the better. There’s nothing more important to the future of the United States, I would argue, than solving the battery technologies and improving storage.”

Mike Kerr, Portfolio Manager



Source: CLSA (lithium-ion price and energy density). Data for 2015 and 2020 are CLSA estimates. Please see back cover for additional information.

- Can better batteries change the world? It's looking increasingly like they can, and many scientists, engineers and entrepreneurs believe that a breakthrough in battery technology may be on the horizon. That could be a game changer for the way the world produces and consumes energy. A long-lasting, affordable battery could enable the broader adoption of electrified vehicles and, when paired with alternative energy sources, store and deliver power around the clock, not just when the sun's shining.
- Now the race is on among corporations to build better batteries. Nearly every major automaker has an electric vehicle for sale and many – notably Toyota and General Motors – are investing millions in designing new batteries to power them. The company that builds the first affordable electric vehicle to drive 200 miles on a single charge will reap the rewards, and the development could accelerate a global transition from fossil fuels to electricity as the energy of choice for the automotive world.
- In the United States, Tesla Motors is among those leading the push for the battery revolution. The California-based company already has a battery-powered car that goes 200 miles on a single charge, but it costs \$70,000. Elon Musk, the company's chief executive, envisions a future in which batteries help the world run on solar power. "We have this handy fusion reactor in the sky called the sun," Musk said recently. "You don't have to do anything. It just works, shows up every day, and produces ridiculous amounts of power."

The following information pertains to the charts on the pages specified below.

**Page 1:** The European Union represents 28 countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Romania and United Kingdom, as defined by International Monetary Fund.

**Page 2:** R&D as a percentage of GPD, based on 2015 estimated data for gross domestic product and gross expenditures on research and development, was calculated and normalized using purchasing power parity (PPP), which estimates the adjustment needed between countries for the exchange rates to be equivalent to each currency's purchasing power. PPP helps determine the exchange rate adjustment, so identical goods and services in different countries have the same price when expressed in the same currency.

**Page 4:** Patents represent utility patents, which are those that may be granted to anyone who invents or discovers any new, useful and nonobvious process, machine, article of manufacture or composition of matter, or any new and useful improvement thereof, as defined by the USPTO. Patent origin is determined by the residence of the first named inventor.

**Page 5:** Watt-hour (Wh) is used to measure the amount of energy a battery can produce in an hour and, as such, is related to the energy capacity of a battery. Watt-hour per kilogram (Wh/kg) is used to measure the density of energy in a battery and is commonly used to compare the energy density of different types of battery materials. Wh can vary, depending on the size of the battery; therefore, Wh/kg is the appropriate unit for measuring the amount of energy that a certain type of battery material can produce, regardless of its size and capacity. Because Wh/kg is measured on a per-weight basis, it excludes the size of the battery and can help differentiate those battery materials that perform better on a per-unit basis. The higher the Wh/kg, the more energy the battery produces per weight and, as a result, the longer lasting it is.

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