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# ECONOMIC UPDATE

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## EXECUTIVE SUMMARY

**AMERICAS: THE U.S. ECONOMY GREW AT A 2.6% ANNUAL RATE IN THE 3<sup>RD</sup> QTR** despite a slowdown in consumer spending amid high inflation and rising interest rates. Other October data showed: **Manufacturing activity** fell, but the forward-looking ISM new orders sub-index rose, indicating resiliency among U.S. consumers. **Employers** added 261,000 jobs, reflecting continued resilience in the labor market. The jobless rate rose to 3.7%. **Consumer sentiment** ebbed amid rising concerns about inflation and a possible 2023 recession. September data showed: **Durable goods orders** gained 0.4%, lifted by a 2.1% jump in orders for transportation equipment. **Factory orders** rose 0.3%, driven by a 21.9% rebound in civilian aircraft orders. Motor vehicle orders dipped 0.1%. Orders for machinery and primary metal products slipped. **The trade deficit** widened sharply in September, as a strong dollar and softening global demand weighed on exports. **Import prices** dropped for a third-straight month, falling 1.2%. **U.S. suppliers** raised prices, increasing the PPI by 0.4%. **The consumer price index** rose 8.2% in the year through September. Used car prices fell 1.1%, while new car prices and car parts increased sharply. **Retail sales** were flat as households cut back on purchases of motor vehicles and other big-ticket items.

**OVERSEAS: FACTORY ACTIVITY AROUND THE WORLD IS SLOWING**, signaling a lagging economy that is curtailed by inflation and rising interest rates. Manufacturing powerhouses in Asia, such as Taiwan and South Korea, saw some of the biggest declines. **Composite PMI for the eurozone** in October declined, the fourth-consecutive month to indicate contraction. Manufacturing suffered the largest drop in activity, particularly in energy-intensive sectors such as chemicals and plastics. **A mild start to the winter heating season** and high natural gas storage levels boosted hopes that Europe can get through the winter without rationing.

**STEEL: STAINLESS STEEL RAW MATERIAL SURCHARGES STOPPED FALLING IN OCTOBER**, ending four months of declines. Steady demand maintained firm base prices. September service center stainless shipments of 134,700 tons were down 10% from a year ago. **U.S. Steel** reported 3<sup>rd</sup>Qtr net earnings of \$490mn, down from \$2bn it netted a year ago. The Electric Arc Furnace unit, which includes the Big River Steel mill, produced about 28% less product. Total USS steel product shipments fell 425,000 tons from a year ago.

**AUTOMOTIVE: GENERAL MOTORS' 3<sup>RD</sup> QTR NET INCOME WAS \$3.3BN VS. \$2.4BN A YEAR EARLIER.** GM said 90% of its operating profit came from North America, mostly from trucks and SUVs. **Toyota** is considering a reboot of its electric-car strategy to better compete in a booming market it has been slow to enter. **The world's top automakers** are planning to spend nearly \$1.2 trillion through 2030 to develop and produce millions of EVs, along with the batteries and raw materials to support that production.

**ENERGY: WESTINGHOUSE ELECTRIC IS BEING BOUGHT BY A PRIVATE EQUITY-BACKED CONSORTIUM.** Westinghouse technology is in nearly half the world's existing nuclear reactors. It may benefit from a push to replace suppliers to the 30+ Western reactors that operate on Russian technology. **Natural-gas prices** have fallen more than 40% since hitting highs in late August, reducing the risk of budget-busting heating bills this winter for millions of Americans and potentially easing a major cost pressure for manufacturers. **France** is falling behind in its plans to return the country's fleet of nuclear reactors to full power this winter after a rash of outages.

**MEDICAL: DEXCOM AND ABBOTT HAVE 'MASSIVE OPPORTUNITY' WITH A NEW CGM COVERAGE PROPOSAL** issued by the Centers for Medicare/Medicaid Services (CMS). The proposal reads very favorably for the leading CGM manufacturers that are targeting the massive, highly under-penetrated Type 2 market opportunity. **Johnson & Johnson** struck a deal to buy heart pump maker Abiomed Inc for \$16.6bn in cash, as it looks to boost growth in its medical devices unit. Abiomed's Impella heart pumps are the smallest in the world.

**AEROSPACE: LOCKHEED MARTIN REPORTED BETTER-THAN-EXPECTED QUARTERLY REVENUE**, helped by higher sales in its Aeronautics unit, as demand for arms increased after Russia's invasion of Ukraine. Sales at Aeronautics, which makes the F-35, rose 7.6% from a year ago to \$7.1bn. **American Airlines** posted 3<sup>rd</sup>Qtr earnings of \$483mn vs. \$169mn a year ago. Revenue surged 50% to \$13.46bn. **Aerospace executives** said the shortage of parts from chips to windshields that has held back plane production will run into at least 2023. Manufacturers are ordering material as far as 2 years in advance, a break with just-in-time models used previously.

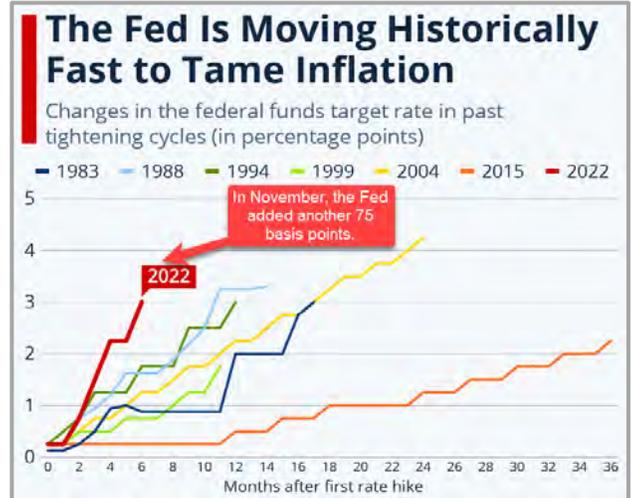
**COMMODITIES: IRON ORE PRICES FELL FURTHER** after Chinese President Xi offered no prospect of changes to policies that have ravaged China's steel demand over the past year. **Prices for lithium hydroxide**, which is used in batteries with high nickel content, are up nearly 150% this year. **Metal traders** are pushing the London Metal Exchange to stop accepting Russian metal, fearing its warehouses will become a stockpile for unwanted material that distorts global prices for commodities such as aluminum, nickel and copper.



## THE AMERICAS

- **The U.S. economy** rebounded strongly in the 3<sup>rd</sup>Qtr amid a shrinking trade deficit, but domestic demand was the weakest in 2 years. GDP increased at a 2.6% annualized rate after contracting at a 0.6% pace in the 2<sup>nd</sup>Qtr. The smaller trade gap added 2.77 points to GDP growth. Final sales to private domestic purchasers edged up at only a 0.1% rate .
- **U.S. employers** added 261,000 jobs in October, a sign of continued resilience in the labor market, and the jobless rate rose to 3.7%. The October payrolls number marked a decline from September's upwardly revised 315,000 jobs. Healthcare, professional and technical services and manufacturing sectors led the gains.
- **The U.S. trade deficit** widened sharply in September, likely as a strong dollar and softening global demand weighed on exports. The trade deficit increased 11.6% to \$73.3 billion. Exports of goods and services fell 1.1%, while imports increased 1.5%.
- **U.S. import prices** dropped for a third-straight month in September, pulled down 1.2% by falling costs for petroleum products and a strong dollar. Imported fuel prices dropped 7.5% after decreasing by the same margin in August. Petroleum prices also fell 7.5%, while the cost of imported food rebounded 0.2%. Export prices dropped 0.8%.
- **Retail sales** were flat in September as households cut back on purchases of motor vehicles and other big-ticket items such as electronics and appliances amid stubbornly high inflation and rapidly rising interest rates. Sales at auto dealerships slipped 0.4%, while receipts at service stations dropped 1.4%. Retail sales increased 8.2% YOY basis.
- **Durable goods orders** gained 0.4% in September, lifted by a 2.1% jump in orders for transportation equipment. Motor vehicle orders accelerated 2.2%. Orders for the volatile civilian aircraft category soared 21.9% after falling 8.6% in August. Boeing received 96 aircraft orders compared to 30 in August. Core capital goods shipments slipped 0.5%.
- **U.S. suppliers raised prices** 0.4% in September from the prior month, keeping pressure on inflation that remains high but is easing some compared with a year ago. The PPI rose 8.5% in September YOY, down from 8.7% in August and 11.3% in June. Prices have begun to fall for some goods and services, including commodities, shipping and housing.
- **The U.S. leading economic indicators** fell again in September and its persistent downward trajectory suggests a recession is increasingly likely before year-end. The Conference Board forecasts real GDP growth will be 1.5% YOY in 2022, before slowing further in the 1<sup>st</sup>H of next year.

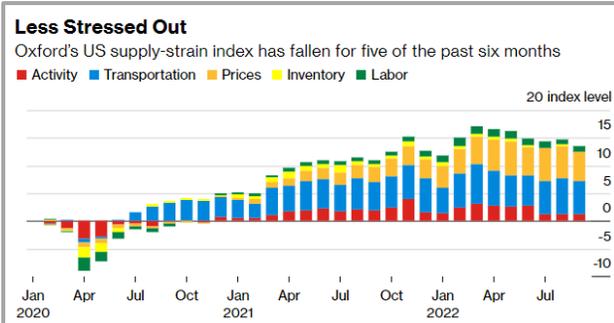
- **The Federal Reserve** has taken very aggressive action to tame inflation this year, raising the federal funds target rate by 375 basis points to 3.75-4.0 since March. Faced with the highest inflation in more than 40 years, the Fed is moving quicker than in past tightening cycles, knowing that it will bring "some pain" to households and businesses.



- **The U.S. will enter a recession** in the coming 12 months as the Fed battles to bring down persistently high inflation and the economy contracts, according to the *WSJ* latest survey. Economists put the probability of a recession in the next 12 months at 63%, up from 49% in July. A *Bloomberg* survey of 42 economists puts the probability at 60%. (A good omen? Every time a Philadelphia baseball team won the World Series, there has been a severe recession.)
- **U.S. Industrial production** rose 0.4% in September as manufacturing and mining gains offset a drop in utilities output. Manufacturing output also rose 0.4% and factory utilization reached 80%, matching the highest level in more than two decades. Motor vehicle and parts production, which has experienced notable volatility because of a global shortage of chips, rose 1%.
- **The consumer price index** rose 8.2% in the year through September, another stubbornly high result driven by more costly food, rent and other items. Stripping out food and fuel to get a sense of underlying price trends, the core index climbed by 6.6%, the fastest pace since 1982. Used car prices dropped 1.1%, while new car prices and car parts continue to increase sharply.
- **Factory orders** rose 0.3% in September and were up 13.0% YOY. September's increase in factory orders largely reflected a 2.2% advance in bookings for transportation equipment, driven by a 21.9% rebound in civilian aircraft orders. Motor vehicle orders dipped 0.1%. Orders for machinery slipped as did those for primary metal products.



- **An Oxford Economics indicator of supply strains** in the U.S. peaked in February and has slowly but steadily improved through September. It helps that consumers in developed economies are cinching their purse strings. “Supply chain conditions should stay on a more encouraging trajectory in the final stretch of 2022 and in 2023. One of the benefits of weakening demand is it will ease stress in supply chains,” said Oxford’s lead economist.



**Key Update:** Spot rates for shipping containers have plunged about 60% this year as carriers struggle with excess capacity. The queue of ships waiting to unload at the ports of Los Angeles and Long Beach fell from a peak of 109 ships in January to four vessels in late October.

- **Sales of previously owned homes** declined 1.5% in September to an annual rate of 4.71mn, the eighth-straight monthly drop. Existing-home sales have declined 27% from their recent peak in January. New-home sales fell 10.9% in September and 17.6% from a year earlier. Housing starts dropped 8.1%. Mortgage rates exceeded 7%, while mortgage applications fell 42% from a year earlier.
- **U.S. manufacturing activity** grew at its slowest pace in nearly 2-1/2 years in October. The ISM survey's forward-looking new orders rose, indicating some resiliency among consumers even as the Fed's actions begin to bite into pocketbooks. With supply chains functioning more normally, inflation pressures continued to recede.
- **The U.S. services industry** expansion slowed at its slowed further in October, as businesses continued to face higher prices for inputs. There were declines in the ISM readings for production, employment and new orders.
- **Construction spending** rebounded 0.2% in September, amid a surge in investment in nonresidential structures that offset a further decline in single-family homebuilding. Federal government construction spending plunged 12.7%. Construction spending advanced 10.9% YOY in September.
- **U.S. consumer spending** rose 0.6% in September, while personal income increased 0.4% and the saving rate fell to 3.1% from 3.4% in August. Private sector wages rose 1.2% in the 3<sup>rd</sup>Qtr, down from a 1.6% jump in the second quarter.

- **Consumer confidence** ebbed in October after two straight monthly increases amid rising concerns about inflation and a possible 2023 recession. The Conference Board consumer confidence index fell to 102.5 from 107.8 in September.
- **U.S. steel mills** shipped 7.675mn tons of steel in August, an 8.7% drop from a year ago. Shipments YTD for eight months were 61.324mn tons, down 2.1% from the same period of 2021. (See **Appendix: Steel**, page 8)
- **Steel imports** into the U.S. in September totaled 2.237mn tons, including 1.858mn tons of finished steel. Total and finished steel imports are up 4.4% and 22.5%, respectively year-to-date vs. 2021. Finished steel import market share was estimated at 24% YTD.
- **U.S. Steel** reported 3<sup>rd</sup>Qtr net earnings of \$490mn, down from what it calls the “all-time best” \$2bn it netted a year ago. Although scrap prices fell throughout the quarter, USS had stocked up on costlier raw materials after Ukraine (a major supplier of pig iron) was invaded by Russia. The company’s electric arc furnace (EAF) minimill segment earned just \$1mn compared with \$424mn in the 3<sup>rd</sup>Qtr of last year. The EAF unit, which includes the Big River Steel mill, produced about 28% less product in the quarter. Total steel shipments fell 425,000 tons from a year ago.
- **Stainless steel** raw material surcharges stopped falling in October, ending four months of declines. Steady demand maintained firm base prices. Nickel has been relatively stable for two months at around \$10/lb, resulting in little change in the total surcharge. A significant drop in the European ferrochrome benchmark, which is indexed quarterly by the domestic mills, will impact total surcharges for the next three months. The chrome component will drop \$0.07/lb to \$1.49/lb for November through January. Service center shipments for the first nine months of 2022 were down 2.1% vs. the prior year. September shipments of 134,700 tons were down 10% from a year ago.
- **Aluminum ingot price** soared briefly following news that the administration is considering a complete ban on Russian aluminum in response to Russia’s military escalation in Ukraine. Metal products from Russia have so far been shielded from sanctions due to their importance in everything from automobiles and skyscrapers to iPhones.  
**Key Update:** Alcoa is lobbying the White House to block American imports of aluminum from Russia following Moscow’s latest military escalation in Ukraine. Separately, Alcoa asked the LME to delist Russian aluminum.



- **The Energy Department** is awarding \$2.8 billion in grants to boost U.S. production of EV batteries and the minerals used to build them, part of a bid to wean the country off supplies from China. Albemarle Corp is among the 20 manufacturing and processing companies receiving grants to domestically mine lithium, graphite and nickel, build the first large-scale U.S. lithium processing facility, construct facilities to build cathodes and other battery parts and expand battery recycling. The grants are going to projects across at least 12 states. (See **Appendix: Automotive**, page 11)
- **Tesla 3<sup>rd</sup>Qtr sales** rose 56% to \$21.5 billion. Tesla expects to come up short of its target for 50% growth in vehicle deliveries, in part because of trouble it's having getting cars from plants to customers. Getting cars onto ships, trains and trucks proved costly and challenging, as much of the EV maker's output was concentrated in the final weeks of the quarter. This contributed to Tesla producing over 22,000 more cars than it delivered during the period.
- **General Motors' net income** in the 3<sup>rd</sup>Qtr was \$3.3bn vs. \$2.4bn a year earlier. Revenue jumped 56% to \$41.9bn from a year ago. GM said 90% of its operating profit came from North America, where it earned \$3.9bn, mostly from trucks and SUVs. GM expects U.S. industry sales next year of 15mn, compared with expectations of 13.7mn this year.
- **General Motors** sees the future of the pickup, and it's an EV that sells for \$100,000. The first version of the electric GMC Sierra, called the Denali Edition 1, will go on sale in early 2024 for \$107,000. It will join an electric Hummer that GMC dealers can sell for more than \$100,000 and a \$105,000 loaded version of Chevrolet's electric Silverado.
- **Toyota** is considering a reboot of its electric-car strategy to better compete in a booming market it has been slow to enter, and it has halted some work on existing EV projects. The proposals under review, if adopted, would amount to a dramatic shift for Toyota and rewrite the \$38bn EV rollout plan Toyota announced last year.
- **The world's top automakers** are planning to spend nearly \$1.2 trillion through 2030 to develop and produce millions of electric vehicles, along with the batteries and raw materials to support that production. Automakers have forecast plans to build 54mn battery electric vehicles in 2030, representing more than 50% of total vehicle production. To support that unprecedented level of EVs, carmakers and their battery partners are planning to install 5.8 terawatt-hours of battery production capacity by 2030.



- **Aerospace executives** said the shortage of parts from chips to windshields that has held back plane production will run into at least 2023, and manufacturers are spending more to tackle the problem. Manufacturers are ordering material as far as two years in advance, a break with just-in-time models used previously to restrain costs, and dispatching specialized staff to keep production lines running.
- **Boeing** reported a loss of \$3.3bn, compared with a \$132mn deficit in the 3<sup>rd</sup>Qtr last year. Its results were weighed by \$2.8bn in charges related to programs including its troubled military refueling tanker and Air Force One replacement jets. Boeing said the defense unit charges were caused by increased manufacturing and supply-chain costs as well as technical challenges, and the problems could persist for another 18 months. Revenue rose 4% from a year ago to \$16 billion. (See **Appendix: Aerospace**, page 10)

**Key Update:** *The U.S. Air Force doesn't expect the KC-46A tanker to be fully ready until 2025, more than five years behind schedule.*

- **Lockheed Martin** reported better-than expected quarterly revenue, helped by higher sales in its Aeronautics unit, as demand for arms increased after Russia's invasion of Ukraine. Sales at Aeronautics, which makes the F-35, rose 7.6% to \$7.1bn, compared to the same quarter a year ago. Profit margins in the unit fell slightly. Sales at the Missiles and Fire Control unit, which makes HIMARS launchers, were up 1.8% to \$2.83 bn, but profit margins also fell slightly.



- **American Airlines** posted 3<sup>rd</sup>Qtr earnings of \$483mn, compared with \$169mn a year ago. Revenue surged 50% to \$13.46bn. The airline projected its 4<sup>th</sup>Qtr revenue 11%-to-13% higher than the same period in 2019 and said its flight capacity next year will be at or slightly below 2019 levels.
- Key Update:** *Airlines say the pandemic-related travel boom shows little sign of tapering off, despite persistent inflation and a murky economic outlook. Passengers have so far been willing to pay higher ticket prices, and flights have been full, allowing carriers to make up for soaring fuel prices and the rising cost of labor as they continue to rebuild their ranks.*

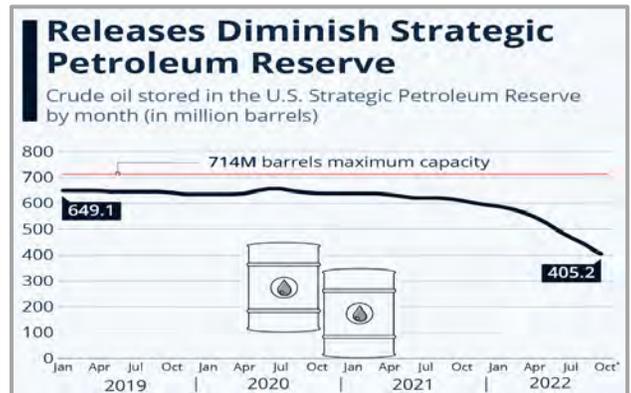
- NASA's DART spacecraft**, the first mission to test a technology that one day might protect Earth from a catastrophic asteroid impact achieved its goal, when a fast-moving spacecraft smashed into and changed the trajectory of a distant space rock. NASA said the intentional collision between its uncrewed spacecraft and the 525-foot-wide asteroid, called Dimorphos, successfully shifted the asteroid's orbit around a larger asteroid called Didymos. Pictured above: An image captured a few minutes after the intentional collision of NASA's DART mission with its target asteroid, Dimorphos.
 

- Dexcom and Abbott** have a 'massive opportunity' with a new continuous glucose monitor coverage proposal issued by the Centers for Medicare and Medicaid Services (CMS). Under the proposal, the CMS would cover CGMs for diabetes patients who are treated with insulin or have a history of problematic hypoglycemia, as defined by the frequency or severity of low blood sugar events, regardless of whether they have Type 1 or 2 diabetes. Analysts at J.P. Morgan said the proposal reads very favorably for Abbott and Dexcom, leading CGM manufacturers that are targeting the massive and highly under-penetrated Type 2 market opportunity. (See [Appendix: Medical](#), page 14)

**Key Update:** *The J.P. Morgan analysts wrote, "It's a step in the right direction and points to a clear path to coverage for all insulin using diabetic patients, opening up a massive opportunity for both Dexcom and Abbott over the next 1-2 years. Penetration rates in the Type 2 population remain exceptionally low, with our forecast across the intensive patients at about 25% or greater in 2022."*

- Abbott Laboratories medical devices sales** in the 3<sup>rd</sup>Qtr were \$3.62bn, a 0.5% YOY decrease. Supply constraints and pandemic-related lockdowns in China affected medical device sales. Abbott is working to fulfill about \$70mn in backorders across its devices. Sales of Abbott's CGM Freestyle Libre products totaled \$1bn in the quarter. Sales of diabetes products in the U.S. climbed more than 40%, while supply constraints with the company's first-generation FreeStyle Libre device cut international sales.
- Lucid Hearing** has joined the wave of companies that are entering the over-the-counter hearing aid market. When the ruling allowing OTC sales took effect in September, Lucid introduced products at both ends of the price spectrum. The company's prices range from \$200 to \$1,700.

- Johnson & Johnson** struck a deal to buy heart pump maker Abiomed Inc for \$16.6 billion in cash, as it looks to boost growth in its medical devices unit after next year's planned spinoff of the consumer health business. Abiomed's Impella heart pumps, the smallest in the world, have been used in the U.S. since 2008. The devices brought in worldwide revenue of \$985 million in fiscal year 2022.
- Natural-gas prices** have fallen more than 40% since hitting highs in late August, reducing the risk of budget-busting heating bills this winter for millions of Americans and potentially easing a major cost pressure for manufacturers. The decline is due to warm autumn weather, record domestic production and gas-storage facilities that have filled up fast since the end of air-conditioning season. Now, one of the big drivers of inflation will cost roughly the same as it did a year ago. (See [Appendix: Energy](#), page 12)
- The U.S. strategic petroleum reserve oil levels** of around 405mn barrels, or 57% of storage capacity, is down from almost 580mn barrels in February before the invasion of Ukraine and more than 650mn at the height of the first coronavirus wave in the spring of 2020.



- Westinghouse Electric** is being bought by a private equity-backed consortium of Brookfield Renewable Partners and uranium fuel supplier Cameco in a \$7.9bn deal. The move reflects renewed global interest in nuclear power, including new U.S. federal incentives, driven by both geopolitical and climate concerns. Westinghouse technology is in nearly half the world's existing nuclear reactors and it also could benefit from a push to replace suppliers to the more than 30 Western reactors that operate on Russian technology.
- Southern Co.**, the utility company building the only nuclear power plant under construction in the U.S., expects the first new reactor at its Vogtle project to be completed by the end of the 1<sup>st</sup>Qtr of 2023. The initial sustained nuclear reaction could occur in January, followed by testing electric power production and safety systems, while a second reactor could be completed by late 2023.

## EUROPE, AFRICA & THE MIDDLE EAST

- **Composite PMI for the eurozone** in October declined, the fourth-consecutive month to indicate contraction. Manufacturing suffered the largest drop in activity, particularly in energy-intensive sectors such as chemicals and plastics. Germany suffered a sharp fall. Its composite PMI fell to its lowest level since May of 2020, when large parts of its economy were locked down. France, which is much less reliant on Russian energy supplies, recorded a stagnation in activity, following growth in September.

**Key Update:** A mild start to the winter heating season and high storage levels have boosted hopes that Europe can make it through the winter without rationing, which has pushed natural-gas prices down below €130 a megawatt-hour from a peak of close to €350 in late August.

- **Mercedes-Benz** is placing major bets on wind projects to keep its operations buoyant in the midst of Europe’s energy crisis. The luxury-car maker is signing up with an energy company to tap a massive wind park in the Baltic Sea starting in 2027. Mercedes also plans to build a wind farm at its Papenburg test track in northern Germany.

- **Rolls-Royce** will start selling its first fully electric vehicle next year, as it commits to ditching combustion engines by 2030 to comply with regulations and changing demand. The 116-year-old company based in West Sussex, England, said that the first Spectre electric cars, priced between £250,000 and £500,000, would be delivered at the end of next year.



(See [Appendix: Automotive](#), page 11)

- **Europe’s automakers** warned they’re likely headed for another year of shrinking sales. Passenger car sales will probably drop 1% to 9.6 million this year, the European Automobile Manufacturers’ Association said. While that outlook suggests there may be some recovery in the closing months (registrations were down almost 12% through August) the lobby group doesn’t expect enough of a bounce back to stick with its original forecast for a bit of growth.

- **Poland chose US-based Westinghouse Electric** to build its first nuclear power plant, tightening relations with Washington in the wake of Russia’s invasion of neighboring Ukraine. The decision is also set to help Poland, the EU’s most coal-dependent country, curb CO<sub>2</sub> emissions. The deal will be for the first three reactors and there’s an expectation that eventually Poland will build six AP1000-type reactors. See [Appendix: Energy](#), page 12)

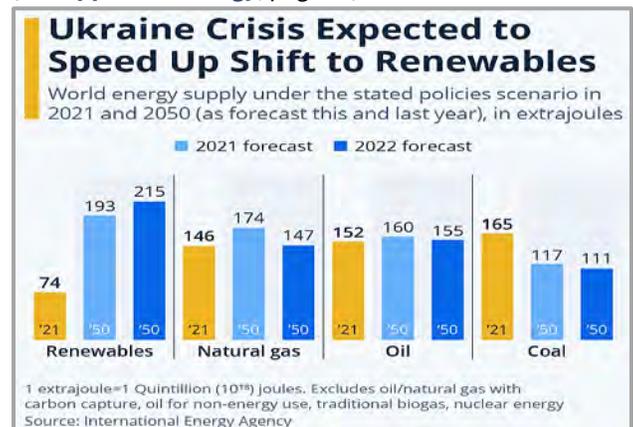
- **France is falling behind** in its plans to return the country’s fleet of nuclear reactors to full power this winter after a rash of outages. Of France’s 56 nuclear reactors, 26 are offline for maintenance or because of corrosion on piping that cools the reactor cores. Fixing the corrosion is taking longer than expected at several reactors, delaying their restart by as much as six weeks. Labor unrest is another obstacle. Strikes at 18 reactors owned by EDF, France’s state-controlled power giant, have delayed their restart by several weeks.

**Key Update:** EDF is the world’s largest owner of nuclear plants. EDF’s fleet of reactors normally exports large quantities of low-cost nuclear power to neighboring countries, helping stabilize prices across the region.

- **German Chancellor Olaf Scholz** ordered the country’s three last remaining nuclear power plants to continue operating until mid-April next year, as Berlin battles to avert an energy crunch this winter. The government will create a “legal basis” to allow the plants to operate beyond 12/31.

- **The war in Ukraine** will be a factor in a quicker transition to renewable energy. In an October release, the International Energy Agency projected demand for fossil fuels falling or plateauing in all forward scenarios it calculated, while it expects the adoption of renewable energy sources to speed up. According to the IEA analysis, the ongoing transition to carbon-neutral sources has not majorly contributed to the recent price hikes that consumers have been seeing.

(See [Appendix: Energy](#), page 12)



- **Royal Philips** revenue declined across its business units in the 3<sup>rd</sup>Qtr. Supply chain problems hampered its ability to deliver and install medical devices, cutting sales by ~5% to €4.3bn. Philips’ Respironics unit, dogged by a recall of 5.5mn sleep apnea ventilators, will take a €1.3bn non-cash impairment due to a proposed consent decree from the U.S. Department of Justice. Philips intends cut 4,000 jobs after recording a net loss of €1.33bn. Most of the layoffs will occur in the U.S., the Netherlands, India and China.

## ASIA/PACIFIC, JAPAN, AUSTRALIA & INDIA

- **Global factory activity** is slowing, signaling a lagging economy curtailed by inflation and rising interest rates. China showed one of the shakiest performances as it is sticking to its zero COVID policy and draconian lockdowns which can hamper factory activity. The Eurozone produced one of the lowest readings at just 46.4 points. Also reading below the 50-points mark, which signals contraction, were Taiwan, South Korea and China. The U.S. index came dangerously close to a contraction at 50.4 points.



- **Total world crude steel production** was 151.7 million tonnes (Mt) in September, a 3.7% increase compared to September 2021. (See [Appendix: Steel](#), page 8)
- **Leading chip equipment suppliers**, including Lam Research, Applied Materials and KLA Corporation, suspended sales to semiconductor manufacturers in China as new U.S. export controls disrupt the Chinese tech industry and global companies' operations.
- **Volkswagen** will invest €2.4bn in a joint venture with one of China's leading designers of artificial intelligence chips, as it bets on AI-assisted and driverless cars as a way to retain share in its biggest market. The company, which earns roughly half of its net profits in China, agreed to partner with Horizon Robotics, taking a 60% stake in the venture.
- **A top executive at BeiGene**, one of China's most prominent biotech companies, said it was "mind-boggling" that Beijing had not allowed sales of COVID-19 vaccines using mRNA pioneered by Moderna and BioNTech/Pfizer to combat the virus. BeiGene's research chief said he thought Chinese authorities wanted to "somewhat protect some of the China vaccines . . . which is unfortunate".

**Key Update:** China is the only big economy that has maintained strict quarantine for international arrivals and lockdowns to curb outbreaks of the virus. The pandemic policies have stunted the country's economic growth and disrupted global supply chains.

- **CO<sub>2</sub> emissions** from global fossil fuel combustion are expected to grow by just under 1% or 300mn tonnes in 2022, a small fraction of the big increase last year of 2bn tonnes, due to record deployment of renewables and EVs, the International Energy Agency reported. This year's increase can be attributed to power generation and the aviation sector as air travel recovers from pandemic lows.
- **Macroeconomic headwinds** have pushed copper futures down almost 30% from a peak in March, despite brisk demand and shrinking inventories that are nearing historical lows. LME copper traded at \$7,549 a tonne in late October, trimming the year-to-date loss to 22%. Copper prices don't reflect a "strikingly tight" physical market.
- **Metal traders** are pushing the London Metal Exchange to stop accepting Russian metal, fearing its warehouses will become a stockpile for unwanted material that distorts global prices for commodities such as aluminum, nickel and copper. The exchange is worried that the price on its market would reflect the glut of cheap, unwanted Russian metal that it holds and not the price charged in deals that are cut directly between producers and consumers.
- **Iron ore prices** fell further after Chinese President Xi offered no prospect of changes to policies that have ravaged steel demand over the past year. China's leader reiterated his zero-tolerance approach to the COVID-19 epidemic, denting optimism for an imminent roll-back of stringent rules to quash outbreaks. There was also little new on the crisis-wracked property sector. The benchmark price fell by 17% in October from September to end the month more than 50% below its 2022 high, which was set in March.



- **Lithium prices** in China hit an all-time high in October as battery manufacturers scramble to secure supply amid booming demand from the electric car market. Chinese battery grade lithium carbonate rose by 1.7% to reach an all-time high of \$74,475 a tonne, more than doubling so far in 2022. Prices for lithium hydroxide, which is used in batteries with high nickel content, are up nearly 150% this year, trading at \$73,925 a tonne in mid October. (See [Appendix: Commodities](#), page 15)

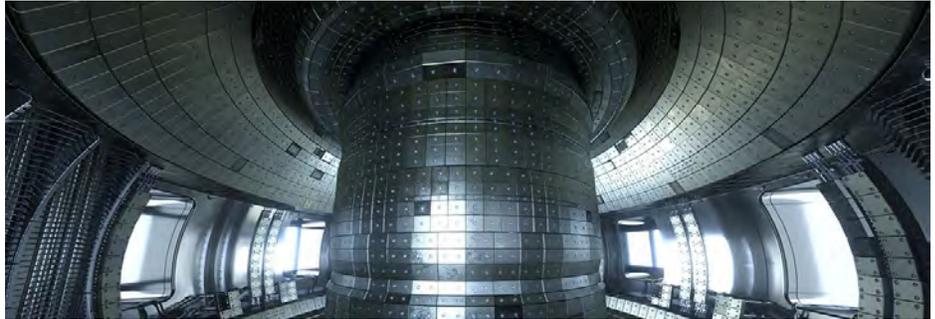


## ECONOMIC UPDATE: APPENDIX TO THE NOVEMBER 2022 ISSUE

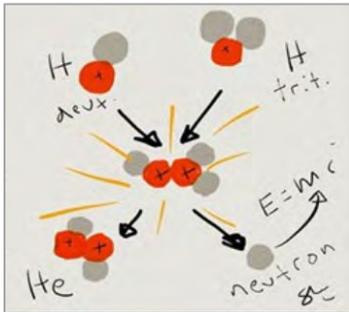
### STEEL/ENERGY: WORLD'S LARGEST FUSION REACTOR OFFERS HOPE FOR CLEAN ENERGY

**A powerful new steel-built tokamak reactor aims to finally achieve the holy grail of fusion-powered electricity generation.**

Deep in the French region of Provence, chosen for its favorable geological, hydrological and seismic conditions, as well as water and electricity access, sits a sprawling 180-hectare facility that houses the International Thermonuclear Experimental Reactor (ITER). Traditional power plants convert heat from fossil fuel combustion or nuclear fission into steam which is then used to rotate turbines that convert mechanical energy into electricity. Both these methods, while reliable sources of power, come with environmental



impacts through emissions or radioactive waste. But what if there was a way of producing this heat without the damaging by-products? This is the dream of fusion power, an ongoing experiment to produce vast amounts of energy through atomic fusion. Identical to the processes that power our sun, fusion occurs when two hydrogen atoms smash together and fuse into a single helium atom. This generates huge amounts of energy without producing radioactive fission products. Creating this process presents a serious engineering challenge, as the reactions must be precisely controlled in a space where massive amounts of energy are being generated.



**The power of a star in a steel-built cage:** At the ITER facility, construction is underway on the world's biggest tokamak reactor. At the heart of this experimental machine, which is based on a Soviet model developed in the 60s, is a torus-shaped vacuum chamber. Weighing 5,200 tonnes and with a volume of 1,400 m<sup>3</sup>, the vacuum chamber is by far the largest of its kind, making it easier for the physicists that operate it to control the reactions needed to generate viable fusion power. ITER's experiments will take place inside this steel-built vacuum vessel, which contains the fusion reactions and is hermetically sealed, acting as the primary safety containment barrier. Here hydrogen fuel is subjected to immense heat and pressure, turning it into the hot, electrically charged gas known as plasma. This vacuum environment provides radiation shielding and supports plasma stability, while cooling water systems that are circulated between its double steel walls safely remove the heat generated while the reactor is active. This is vitally important as temperatures of between 150 and 300 million °C are required for fusion.

**The power of magnetic fields:** The doughnut shape of the interior allows the plasma particles inside to circle continuously without touching the walls. This superhot plasma is contained and controlled in the tokamak reactor by magnetic fields produced by 10,000 tonnes of superconducting magnets. Able to produce stronger fields than conventional magnets when kept at temperatures of -269°C, ITER uses 'high-performance, internally cooled superconductors' in which superconducting strands are bundled together and contained in a structural steel jacket. This means of generating magnetic fields is also cheaper and less-energy consuming than alternatives, making it the only viable option for the massive magnet systems needed to support fusion power. The vacuum vessel and its superconducting magnet system are all contained within the ITER cryostat, which provides an ultra-low temperature vacuum space. **At 16,000 m<sup>3</sup>, it is the largest stainless steel high-vacuum pressure chamber ever built.** The extreme temperature differences contained in the reactor make stainless steel an ideal choice. Able to maintain performance at high and low temperatures, steel's high ductility and toughness make it an irreplaceable part of ITER. With the tokamak expected to be up and running by 2025, fusion physicists hope that this will be a game changer for energy generation. While the prospect of near-limitless clean energy remains beyond the horizon, it is clear that if we are to achieve commercial fusion it will be the enduring power of steel that allows us to harness it.





## STEEL/INNOVATION: RECYCLING MADE MORE EFFICIENT WITH STAINLESS-BUILT HOME PROCESSING UNIT

**A revolutionary new approach to recycling aims to bring the process into people’s homes, guaranteeing closed loop recycling and product remanufacture.** The Lasso system is a sleek, scaled-down industrial recycling facility that can fit inside the home alongside any other domestic appliance. Able to be installed using the same connections as a dishwasher, the unit can recycle glass, plastic and even metals. Unlike traditional street collection recycling systems, which have multiple material streams all mixed together, the Lasso produces recycled materials of far higher quality that can then be remanufactured into goods of similar value. This is a vast improvement on the efficiency of the current system where less than half of the materials collected for recycling are actually recycled, with the majority of this being remade into lower value products.



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**Smart recycling:** Loading the Lasso is very simple, with separate trays for different plastics, colors of glass and metals. The machine will not run with materials in the incorrect placings, so there is no chance of contamination of recycling streams. This is made possible through special sensors and software that can analyze a material in seconds. This system can also integrate with local bottle deposit schemes, scanning barcodes and refunding credit to your account. Once all the materials are correctly placed, the user simply adds detergent and the unit begins its wash cycle. High pressure spraying removes labels, adhesives and any other debris or residue before the recycling is dried ready for the next phase. Miniature granulators specially designed for each material to be processed in a manner that optimizes their remanufacture. Once ground down, the materials are stored separately by their material and color.

**Smart collection:** The team at Lasso estimates that a standard household would need to empty their Lasso roughly once every 8-10 weeks. Users are notified that the unit is at capacity via the app or on the appliance itself. There are no specific collection days planned; instead, users can simply book a no-fee pick-up through the app and be ascribed a timed slot for when a collection vehicle is able to reach their location. Then the removable product storage container can simply be taken to the street and the app will notify the user upon collection.

**Smart materials:** The Lasso is an appliance that requires a high degree of material toughness, so its components will be largely manufactured from steel and stainless steel, allowing it to reliably process materials such as glass and metals. Manufacturing predominantly from steel also means that the appliance itself can be near-fully recycled at the end of its useful life. Each Lasso unit is already made from 40% recycled steel, further emphasizing its closed-loop credentials. With just 2% of material globally being recycled in a closed loop, innovative, steel-built alternatives like the Lasso present a viable opportunity to lower environmental impacts and limit the extraction of raw materials.

## INNOVATION/AEROSPACE: U.S. MILITARY MAKES THE MOVE TO DIGITAL RADAR

Researchers at Sandia National Laboratory are developing digital radar technology, Multi-Mission Radio Frequency Architecture, that will replace legacy analog radars commonly used by the military. The lab is making this move because digital technology is finally at a point where the switch from analog to digital can be more easily made. **The overhauled design promises U.S. warfighters more flexibility and performance during intelligence, surveillance and reconnaissance missions, even against sophisticated adversaries.** Prototypes are currently being flight-tested and the technology could be ready in the next two years. The new digital radar can be reconfigured for different functions such as communication, navigation or electronic warfare, reducing the need for additional hardware. Soldiers and sailors will be able to download tools for each mission as firmware and software onto equipment about the size of a small toolbox. The research team is using advanced electronic components developed for 5G cellphone systems to gain major advantages in performance and agility over similar technologies. 5G technology increases the amount of information wireless technologies can transmit and receive. Sandia is using it to create digital processing tools that convert massive amounts of analog data to digital signals and vice-versa, such as a digital version of a synthetic aperture radar, a remote radio-frequency imaging method widely used national security missions. The new radar architecture and wireless communication can operate simultaneously on several radio-frequency channels to work together on a single function or work independently on several different functions. The use of commercially available electronics is driving down the cost of these sophisticated systems, providing a clear path of upgrades as the technology continues to advance. The new architecture also sets the stage for using highly agile antennas that will be developed. The new architecture will be harder for an adversary to jam or disrupt. An adversary that knows it is being watched by a radar can use countermeasures to degrade the radar’s performance. But Sandia’s system lets military operators change characteristics of their transmitted signal in real-time, making it harder to recognize and jam. In addition, the new radar can be used to analyze complex radio-frequency environments filled with many kinds of signals.

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## AEROSPACE: THE SPACE STATION RACE, NASA-FUNDED COMPETITION FOR ISS REPLACEMENT

U.S. companies including Jeff Bezos's Blue Origin, Sierra Space, Northrop Grumman, Axiom Space, Lockheed Martin and Nanoracks were spurred by a NASA-funded competition to design privately-owned replacements for the International Space Station (ISS), due to be decommissioned by the end of the decade. Four initial contracts have already been awarded and the winner, or winners, to be selected by NASA in around 2025 could expect an estimated \$1bn in annual revenues from the American space agency to deliver space station

### Space stations currently in orbit

#### The International Space Station (ISS)

A collaboration between the US, Russia, the European Space Agency, Japan and Canada. In orbit since the first module's launch in 1998 and continuously occupied since 2000. It will be deorbited after 2030.

Modules have been gradually added to reach its current mass of 444,615kg

Components built by:  Japan,  US,  Europe,  Russia,  Canada

#### Tiangong, Chinese space station

Tianhe Core module, launched in 2021  
Wentian lab module, Added in July 2022  
A final module is due to be added in October 2022. When complete the station's mass will be approximately 100,000kg. It is expected to be in use for 10 years

#### Where they are

The diagram below shows both stations' locations at approximately 3pm GMT on Aug 30

Both orbit at approximately 27,500km per hour, circling the Earth 16 times in a day

Boeing 747 and both space stations to scale

Graphics: Ian Scott, Bob Hodoff  
Sources: NASA, National Space Centre, ESA, computer, FT research

### Nasa contracts to develop commercial space modules

Crew interiors have been designed by French designer Philippe Starck

**Axiom Space**  
\$140mn contract to provide at least one habitable commercial module attached to the ISS, awarded Feb 2020. Axiom plans to construct modules initially attached to the ISS's Harmony module in the following sequence:

- AxH1** First module. Space for four crew and research and manufacturing facilities. Docking adapter and four ports allow for docking module addition
- AxH2** Quarters for four further crew plus extra research volume, docking ports and a robotic arm
- AxRMF** A repurposed ISS module to act as a dedicated research and manufacturing facility
- The Earth Observatory** will provide 360-degree views
- AxPTM** Power and thermal module. Once attached, the station can generate its own power via the solar array. It will also have extra storage and an airlock for spacewalks. Once online, the station can detach from the ISS and operate independently

**Nanoracks Starlab**  
\$160mn contract to develop commercial destinations in space, awarded Dec 2021. Consortium has already supplied an airlock and other facilities for the ISS

**Blue Origin**  
\$130mn awarded, Dec 2021. Planned to be operational by 2027, the Orbital Reef station, a collaboration with Sierra Space, is designed to support a crew of 10 in an 830 cubic metre habitat

**Large-diameter core modules** provided by Blue Origin  
**Large Integrated Flexible Environment (LIFE) modules** provided by Sierra Space

**Sierra Space's Dream Chaser** spaceplane for crew and cargo transportation

**Single person spacecraft** for spacewalks and tourist excursions

**Northrop Grumman**  
\$125.6mn awarded, Dec 2021. Using experience gained building the Habitation and Logistics Outpost (HALO), a vehicle planned for future lunar missions, it will first support four crew members, with plans to expand that to eight or more

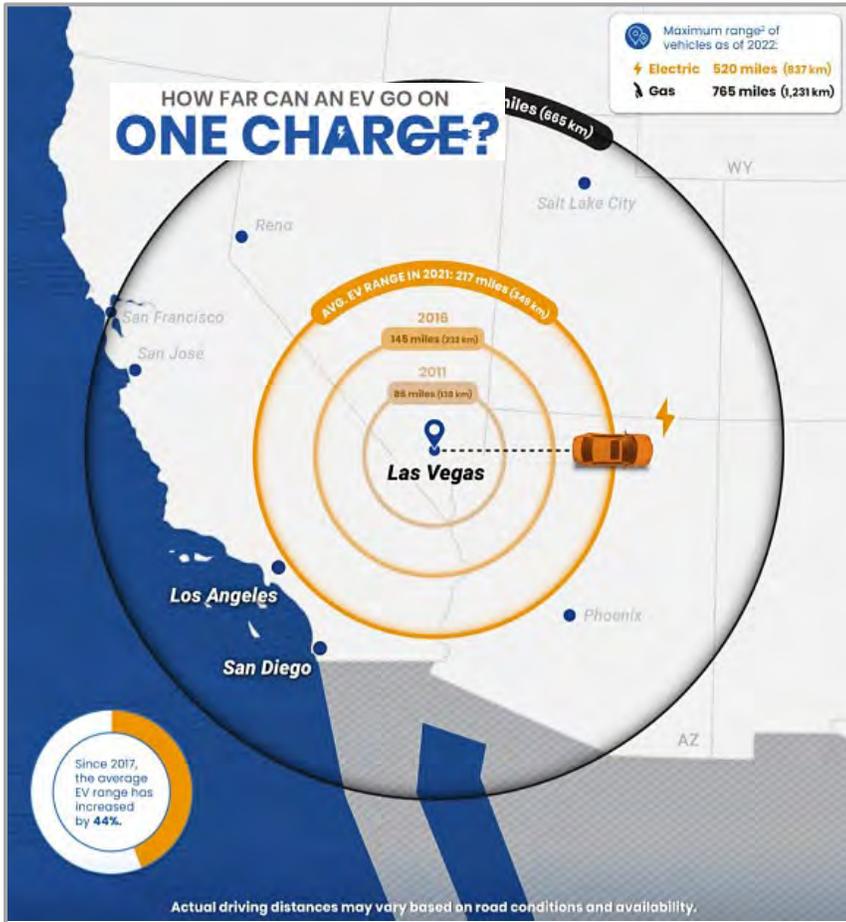
**Habitat modules**  
Solar arrays  
Radiators for thermal control  
Cygnus spacecraft for cargo resupply  
SpaceX Dragon for crew transportation  
Docking ports for future expansion

services. **The contenders are hoping for a bigger prize: to become the go-to platform for a rapidly emerging space economy spanning research, manufacturing, tourism, entertainment and more.** The ISS has been the trailblazer, the greatest global collaboration in the history of technology. During 22 years of continuous habitation, it has hosted 258 astronauts and cosmonauts from 20 countries and thousands of ground-breaking experiments. "Research conducted aboard the ISS has spanned every major scientific discipline," said a transition report prepared for Congress earlier this year by NASA. Work on the space station has helped the development of drugs for cancer, Alzheimer's and Duchenne muscular dystrophy. Even household goods such as fabric softener have been enhanced thanks to space-based research, leading to three patents registered by consumer goods company Procter & Gamble. While the space station is nearing the end of its life, back on Earth cost considerations and geopolitical tensions are making it harder to sustain the remarkable collaboration between five

space agencies (those of the U.S., Russia, EU, Canada and Japan) that has kept it aloft for far longer than intended. The ISS has cost more than \$159bn over its lifetime and some \$3bn a year to operate, roughly one-third of NASA's annual budget for human space flight. The shift to commercial platforms could free up some \$1.8bn a year by 2033, according to NASA — funds that could be used for a new age of space exploration.



## AUTOMOTIVE: THE RANGE OF ELECTRIC CARS VS. GAS-POWERED CARS



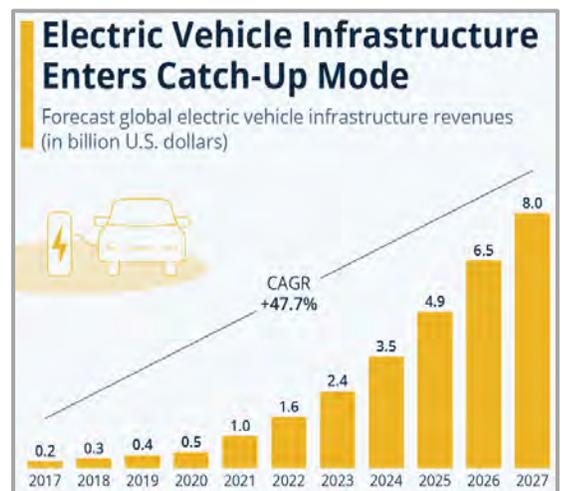
EV adoption has grown rapidly in recent years, but many prospective buyers still have doubts about electric car ranges. In a survey, 33% of new car buyers chose range anxiety—the concern about how far an EV can drive on a full charge—as their top inhibitor to purchasing electric cars. So, how far can the average electric car go on one charge, and how does that compare with the typical range of gas-powered cars?

**The Rise in EV Ranges:** Thanks to improvements in battery technology, the average range of electric cars has more than doubled over the last decade, according to data from the International Energy Agency. As of 2021, the average battery-powered EV could travel 217 miles on a single charge. It represents a 44% increase from 151 miles in 2017 and a 152% increase relative to a decade ago. Despite the steady growth, EVs still fall short when compared to gas-powered cars. For example, in 2021, the median gas car range (on one full tank) in the U.S. was around 413 miles—nearly double what the average EV would cover. As automakers roll out new models, electric car ranges are likely to continue increasing and could soon match those of their gas-powered counterparts. It's important to note that EV ranges can change depending on external conditions.

**What Affects EV Ranges?** In theory, EV ranges depend on battery capacity and motor efficiency, but real-world results can vary based on several factors: (1) Weather: At temperatures below 20°F, EVs can lose around 12% of their range, rising to 41% if heating is turned on inside the vehicle. (2) Operating Conditions: Thanks to regenerative braking, EVs may extend their maximum range during city driving. (3) Speed: When driving at high speeds, EV motors spin faster at a less efficient rate. This may result in range loss. On the contrary, when driven at optimal temperatures of about 70°F, EVs can exceed their rated range.

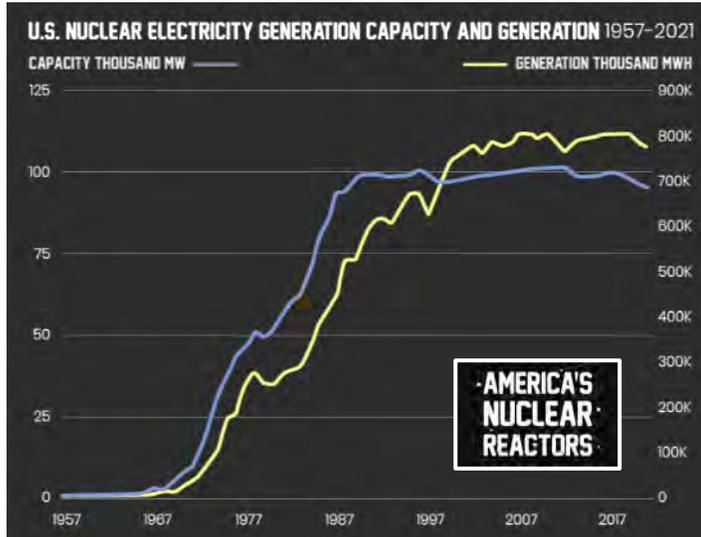
## AUTOMOTIVE: ELECTRIC VEHICLE INFRASTRUCTURE ENTERS CATCH-UP MODE

With bans on the production of gasoline and diesel-powered cars on the horizon in a number of key markets, the pace of EV penetration is really picking up. When it comes to public infrastructure to match this growing demand, a lot of countries are still a long way behind. As the latest forecasts from Statista's *Mobility Market Outlook* indicate, revenues in this essential piece of the electric mobility puzzle are finally starting to enter catch-up mode. As this infographic shows, after a number of years with slow progress being registered, turnover in the sector is picking up at a more significant speed. When measured from 2017 to 2027, Statista currently expects a 47.7% compound annual growth rate for global electric vehicle infrastructure revenues. The report defines the scope of the forecasts as follows: "The electric vehicle infrastructure segment includes public charging stations. In this context, 'public' means that the charging infrastructure is reachable via unrestricted access. Therefore, private charging stations at homes or residential parking lots, workplaces, car dealers, etc. are not included."





## ENERGY: NUCLEAR REACTORS IN THE U.S. — THE WORLD’S LARGEST PRODUCER OF NUCLEAR POWER



**The U.S. is the world’s largest producer of nuclear power, representing more than 30% of the world’s nuclear power generation.** America has 92 reactors in operation, providing about 20% of the country’s electricity.

**Nuclear Development:** Nuclear power in the U.S. dates back to the 1950s. George Westinghouse produced the first commercial pressurized water reactor in 1957 in Shippingport, Pennsylvania. The technology is used in approximately half of the 450 nuclear power reactors worldwide. Today, over 30 different power companies across 30 states operate nuclear facilities in the U.S., and most nuclear power reactors are located east of the Mississippi River. Illinois has more reactors than any state, with 11 reactors and the largest total nuclear electricity generation capacity at about 11,582 megawatts. Meanwhile, the largest reactor is at the Grand Gulf Nuclear Station in Port Gibson, MS, with a capacity of 1,500 MW. Most

American reactors in operation were built between 1967 and 1990. Until 2013, there had been no new constructions started since 1977, according to the World Nuclear Association. Nuclear power reactors in America receive 40-year operating licenses from the U.S. Nuclear Regulatory Commission, with companies able to apply for 20-year extensions. The oldest operating reactor, Nine Mile Point Unit 1 in New York, began commercial operation in December 1969. The newest reactor to enter service, Watts Bar Unit 2, came online in 2016.

**The Future of Nuclear Power in the U.S.:** Nuclear power’s capacity peaked in 2012 at about 102,000 MW, with 104 nuclear reactors operating. Since nuclear plants generate nearly 20% of U.S. electricity and about half of the country’s carbon-free electricity, the recent push from the Biden administration to reduce fossil fuels and increase clean energy will require significant new nuclear capacity. Today, there are two new reactors under construction (Vogtle 3 and 4) in Georgia, expected to come online before 2023. Furthermore, some of the Inflation Reduction Act provisions include incentives for the nuclear industry. Starting in 2024, for example, utilities will be able to get a credit of \$15 per megawatt-hour for electricity produced by existing nuclear plants. **Nuclear infrastructure projects could also be eligible for up to \$250 billion worth of loans to update, repurpose and revitalize energy infrastructure that has stopped working.**

## ENERGY: EDF RECONSIDERS CLOSURE OF BRITISH REACTORS

EDF Energy, a British energy firm, is reviewing whether the closure of two of Britain’s five remaining nuclear power plants could be postponed beyond 2024, to help bolster domestic energy supplies. The French-owned energy group said that given the “severity of the energy crisis”, it would review the case for short extensions at the Hartlepool and Heysham 1 nuclear power plants in the north of England, which between them have a generation capacity of more than 2.2 gigawatts and produce enough electricity for 4mn homes. Both stations are set to close in March 2024 but analysts fear energy supplies will remain under pressure across Europe over the next couple of winters as governments move to reduce their dependence on Russian gas. Industry experts have suggested extensions of one to two years might be feasible, although EDF offered no details on how long the closure could be postponed. It would have to make a safety case to Britain’s nuclear regulator for any extension, which would depend on the reactors’ graphite cores.

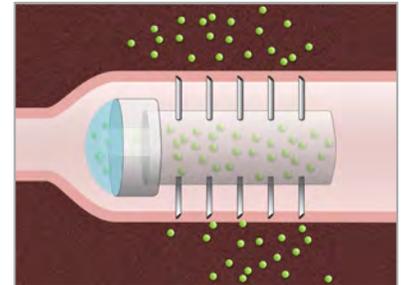


**Other nuclear power plants have been forced to close as cracks were found in their cores, but EDF said recent inspections showed that the graphite at both Hartlepool and Heysham 1 remained intact.** The move comes as European states have been revisiting the closure of existing nuclear plants and building fleets of reactors to help alleviate the continent’s reliance on gas. Germany is keeping two of its three nuclear plants, which were due to close at the year-end, on standby this winter in case of an energy crunch. France, already a nuclear energy powerhouse, is among the European countries considering building new reactors. The UK government was criticized by unions and academics for allowing the Hinkley Point B plant in Somerset to close, despite fears Britain could face crunch points this winter when electricity supplies will be insufficient to meet demand. The government has intervened to ensure that three coal-fired power stations, which were due to close units this winter, will remain on standby in the event of shortages. Britain’s nuclear power fleet is dwindling rapidly. By the end of 2028, only one of the existing fleet is expected to remain open, Sizewell B in Suffolk.



**MEDICAL/INNOVATION: NEW DRUG-DELIVERY CAPSULE MAY REPLACE INJECTIONS**

Given a choice, most patients would prefer to take a drug orally instead of getting an injection. Unfortunately, many drugs, especially those made from large proteins, cannot be given as a pill because they get broken down in the stomach before they can be absorbed. To help overcome that obstacle, **researchers at MIT and Massachusetts General Hospital have devised a novel drug capsule coated with tiny stainless steel needles that can inject drugs directly into the lining of the stomach after the capsule is swallowed.** In animal studies, the team found that the capsule delivered insulin more efficiently than injection under the skin, and there were no harmful side effects as the capsule passed through the digestive system. “This could be a way that the patient can circumvent the need to have an infusion or subcutaneous administration of a drug,” says Giovanni Traverso, a research fellow at MIT. Although the researchers tested their capsule with insulin, they anticipate that it would be most useful for delivering biopharmaceuticals such as antibodies, which are used to treat cancer and autoimmune disorders like arthritis and Crohn’s disease. This class of drugs, known as “biologics,” also includes vaccines, recombinant DNA and RNA. The large size of these biologic drugs makes them nonabsorbable. Before they would be absorbed, they’re degraded in the GI tract by acids and enzymes that eat up the molecules and make them inactive. Scientists have tried designing microparticles and nanoparticles that can deliver biologics, but such particles are expensive to produce and require a new version to be engineered for each drug. The MIT researchers set out to design a capsule that would serve as a platform for the delivery of a wide range of therapeutics, prevent degradation of the drugs and inject the payload directly into the lining of the GI tract. **Their prototype acrylic capsule, 2 centimeters long and 1 centimeter in diameter, includes a reservoir for the drug and is coated with hollow, stainless steel needles about 5 millimeters long.** Previous studies of accidental ingestion of sharp objects in human patients have suggested that it could be safe to swallow a capsule coated with short needles. Because there are no pain receptors in the GI tract, patients would not feel any pain from the drug injection. To test whether this type of capsule could allow safe and effective drug delivery, the researchers tested it in pigs, with insulin as the drug payload. It took more than a week for the capsules to move through the entire digestive tract, and the researchers found no traces of tissue damage, supporting the potential safety of this novel approach. They also found that the microneedles successfully injected insulin into the lining of the stomach, small intestine and colon, causing the animals’ blood glucose levels to drop. This reduction in blood glucose was faster and larger than the drop seen when the same amount of insulin was given by subcutaneous injection. This approach could also be used to administer vaccines that normally have to be injected. The team now plans to modify the capsule so that peristalsis, or contractions of the digestive tract, would slowly squeeze the drug out of the capsule as it travels through the tract. They are also working on capsules with needles made of degradable polymers and sugar that would break off and become embedded in the gut lining, where they would slowly disintegrate and release the drug. This would further minimize any safety concern.


**MEDICAL: HOSPITAL PROCEDURES STEADY DURING THE 2<sup>ND</sup> HALF A BOOST FOR MEDTECHS**

Hospitals are experiencing fewer cancellations and staffing levels have improved since the first half of 2022, which bodes well for MedTech in general, according to a survey by Evercore ISI. Procedure volumes, which have increased so far in 2022, were consistent with the 2<sup>nd</sup>Qtr, the poll of 25 hospitals found. Almost a quarter of respondents said cancellation rates had improved, which should be a positive for



orthopedics companies like Zimmer Biomet and Stryker, the analysts wrote. The hospitals also said they had experienced an improvement in labor shortages since the first half of the year, which have lingered since the height of the COVID-19 pandemic. Still, more hospitals plan to trim their capital spending next year, a concern that surgical robotics companies called out last quarter. **About 70% of hospitals surveyed said inflation and cost pressures have worsened, and as a result 32% expect their 2023 budgets to decline. Hospital spending on capital equipment, including soft tissue and orthopedic robots, is expected to decline.** The main priorities for capital spending were upgrading outpatient OR suites and buying surgical and ICU beds, while spending

on soft tissue and orthopedic robotics were lower on the priority list for 2023. Looking to diagnostics, about half of the hospitals said they expect to use point-of-care PCR tests for COVID-19 next year, which is good news for companies like Danaher, the analysts said. A smaller portion, about 32%, plan to use central lab PCR tests. The survey results follow comments made by some MedTech companies to RBC Capital Markets analysts earlier in September that staffing woes and inflationary pressure have been easing.



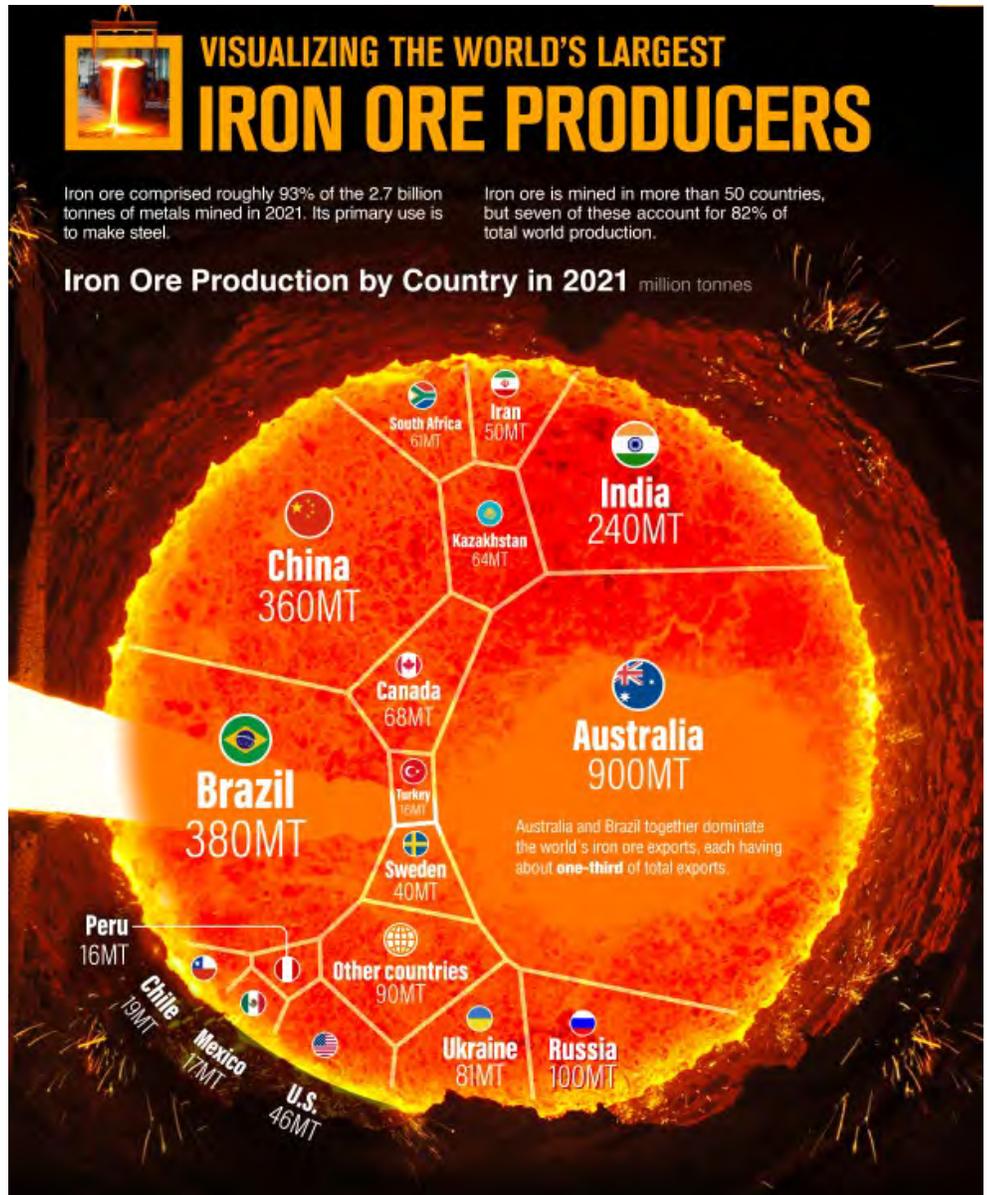
## COMMODITIES: VISUALIZING THE WORLD'S LARGEST IRON ORE PRODUCERS BY COUNTRY

Iron ore comprised roughly 93% of the 2.7 billion tonnes of metals mined in 2021. It is used primarily (98%) to make steel, with the remaining 2% becoming magnets, auto parts and catalysts. Using data from the U.S. Geological Survey, this infographic lists the world's largest iron ore producers in 2021.

**Pilbara and Carajás Iron Ore:** Iron is the fourth-most abundant element on the planet after oxygen, silicon, and aluminum, constituting about 5% of the Earth's crust. Australia produced 35% of the iron ore mined last year. Almost 90% of identified iron ore resources in the country occur in Western Australia, especially in the Pilbara region. The large and dry region is known for its Aboriginal peoples and also for its red earth as a result of a chemical reaction of iron exposed to air and water. The three major Pilbara iron ore producers are also among the top mining companies in the world: BHP Group, Rio Tinto Ltd and Fortescue Metals. After Australia, Brazil is the second biggest producer, with iron ore accounting for 80% of the country's mining exports. **Brazil's biggest public company, Vale, is the world's largest producer of iron ore and nickel.** The company runs the Carajás mine, the largest iron ore mine in the world. Located in the state of Pará, in the north of the country, the mine is operated as an open-pit mine and is estimated to contain roughly 7.2 billion metric tons of iron ore. Together, Australia and Brazil dominate the world's iron ore exports, each having about one-third of total exports. China is the largest consumer of

iron ore, used to feed its steel industry. Despite being the third largest producer, China still imports around 80% of the iron ore it uses each year. The country brought in 1.12 billion tonnes of the commodity last year.

**Iron Ore's Role in the Green Economy:** Iron ore demand is expected to rise in the coming years as steel plays a crucial role in producing and distributing energy. Steel is used extensively in agriculture, solar and wind power, and also in infrastructure for hydroelectric. Furthermore, steel is used for the production of transformers, generators, and electric motors, along with ships, trucks, and trains.



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## SUSTAINABILITY IS CORE TO OUR BUSINESS

# Stainless Steel: The Ultimate Green Raw Material

Did you know that stainless steel is 100% recyclable? In fact, more than half of all the stainless steel in use today is from scrap. Beyond supplying green material, Ulbrich is committed to maintaining the highest sustainability standards, earning us the ISO 14001: 2015 certification.



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## CONTACT US WITH ANY SPECIFIC NEEDS

Ulbrich Stainless Steels & Special Metals, Inc., has highly trained and experienced engineers, product managers, metallurgists, and sales executives available to assist you in all aspects of material selection and production of your stainless steel or special metals requirements.

**Call** | 800-243-1676 or 203-239-4481

**Email** | [economicupdate@ulbrich.com](mailto:economicupdate@ulbrich.com)

## ULBRICH CORPORATE HEADQUARTERS

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*Ulbrich's Economic Update* is prepared monthly by Charles Finnegan for the exclusive use of Ulbrich Stainless Steels & Special Metals, Inc. This issue and previous Economic Updates are archived on Ulbrich's website: [www.ulbrich.com/blog](http://www.ulbrich.com/blog)

Charles was a Senior Vice President of procurement in the metal container industry, with a career spanning nearly four decades. He specializes in steel and aluminum procurement and utilizes his expansive knowledge of the steel and aluminum industry in the production of this detailed monthly update for Ulbrich and the company's valued employees and partners.



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