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Ulbrich ECONOMIC UPDATE
Volume 1 • Number 1 • September 2019

EXECUTIVE SUMMARY

AMERICAS: ULBRICH CELEBRATED LABOR DAY along with the rest of the nation, commending the men and women of the company who contribute to the strength, prosperity and endurance of our country. The holiday's respite was tempered by heightened concerns about the economy after the U.S. and China imposed **a new round of tariffs** in the latest escalation of the trade war. August economic data brought a growing number of signs that the U.S. may be headed for a recession. **U.S. manufacturing activity** dipped for the first time in three years as domestic manufacturers grappled with the fallout from the trade uncertainties. The ISM index of factory activity slid into contraction territory, indicating the manufacturing sector is weakening. **The housing market** continued to struggle as housing starts and new home sales declined. Consumer sentiment about current economic conditions fell to its lowest level since 2016. Still, there were **positive signs** as continued consumer spending powered on, pushing U.S. retail sales higher. Employers added 130,000 jobs and the latest leading economic indicator (LEI) index rose after two-consecutive monthly declines.

OVERSEAS: THE EUROPEAN UNION looked particularly fragile, with a weakening Germany at its core and the mounting prospect of losing the U.K. without a negotiated exit on Oct. 31. **The expansion of world merchandise trade volumes** is likely to remain weak in the 3rdQtr according to the WTO's Goods Trade Barometer. The Eurozone Manufacturing PMI rose slightly in August, but it marked the seventh consecutive contraction of factory activity. New orders, output, employment and purchasing activity fell further. **Factory activity in China** shrank in August for the fourth month in a row as the U.S. ramped up trade pressure. China's domestic demand remained sluggish, pointing to a further slowdown. **Japan's exports** slipped for an eighth month in July, and manufacturers' confidence turned negative for the first time in over six years as China-bound sales slumped again.

STEEL: STAINLESS STEEL PRICES IN THE U.S. were pushed higher by increases in stainless surcharges, while base prices held flat and seem unlikely to change in the near term. Stainless steel scrap prices climbed higher in August, following the surge in nickel prices. **Total steel imports into the U.S.** were down 11% through July. Outokumpu forecast stable 3rdQtr **stainless steel deliveries** in the Americas but lower shipments in Europe. Their projection to 2024 has global demand expanding, especially in automotive, consumer and medical goods, energy and heavy industry.

METALS/COMMODITIES: NICKEL PRICES soared to a nearly five year high after Indonesia expedited a ban on ore exports, raising concerns about shortages of the metal. LME nickel prices have now surged 68% in 2019. **Iron-ore prices** collapsed 27% by the end of August, their biggest one-month fall in eight years. **Copper** skidded to its lowest price since mid-2017. Long known as a canary in the coal mine for the economy, copper's price has slumped 16% since mid-April due to a sharp downturn in factory output and warnings that major economies are heading into recession.

AEROSPACE: PLANE DELIVERIES by **Boeing** for the year through July were down 38% from a year ago. The cost to airlines and the supply chain is estimated at $4 billion every quarter the MAX is grounded. **Lockheed** will keep the F-16 flying with an $8 billion sale to Taiwan. **Sierra Nevada Corp.** chose the Boeing/Lockheed joint venture UAL as its resupply partner to the Space Station and ULA's new Centaur rocket as its launch vehicle.

AUTOMOTIVE: U.S. LIGHT VEHICLE SALES rose for the second straight month in August, helped by five sales weekends. **The UAW union** selected GM as its initial target for a new contract as current labor pacts with the Detroit 3 automakers expire Sept. 14. The **auto parts industry** is cutting payrolls in response to the strains of falling vehicle sales, rising material costs and huge demands for R&D spending. **Tesla** raised prices in China ahead of new Chinese tariffs on imported U.S. cars, increasing the pressure on Tesla to fast-track production at its new Shanghai plant.

MEDICAL: THE MEDICAL DEVICE INDUSTRY has already felt the sting of the trade tensions between the U.S. and China, paying tariffs of up to 25% on $860 million in Chinese imports and nearly $5 billion in goods exports to China. Stryker Corp., **a manufacturer of robotic arms** for hip and knee replacement surgery, reported its Mako robotic surgical system is achieving better outcomes for patients, leading to market share gains. **Implantable devices** are becoming more mainstream, including an FDA approved continuous glucose monitoring system for Type 1 diabetics.

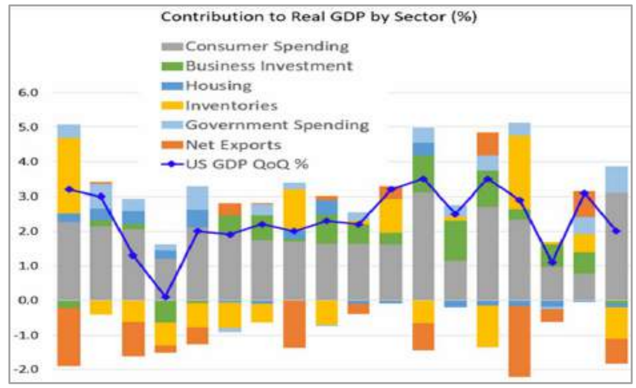
ENERGY: RENEWABLE ENERGIES briefly generated more electricity than coal earlier this year for the first time in U.S. history. A **solar energy facility** constructed for Fifth Third Bankcorp was dedicated in August. It is expected to generate clean power ≥ the amount the company uses in a year, eliminating 143,000 tonnes of greenhouse gases. Wind and solar generated power is competitive with natural gas, without subsidies. The August World Nuclear Industry Status Report showed that **nuclear reactor startups** are climbing briskly in China and boosting nuclear operating capacity.

INNOVATION: THE WORLD'S 10 MOST INNOVATIVE ECONOMIES in 2019 are led by South Korea, followed by Germany and Finland. The U.S. was ranked 8th. Russian and German scientists have developed **multifunctional metal alloys** that absorb and emit heat at the same time and change their volume and size under the influence of a magnetic field. These alloys may have applications in medicine and industry.

THE AMERICAS

- **The U.S. trade deficit** narrowed slightly in July, but the gap with China surged to a six-month high. The July deficit dropped 2.7% to $54.0 billion as exports rebounded and imports fell. American goods exports increased 0.9% to $138.2 billion, while goods imports dropped 0.2% to $211.8 billion. The import bill was pulled down by a $1.5 billion decline in capital goods imports. The drop in capital goods imports suggests business investment could remain weak in the third quarter after contracting in the April-June period for the first time in three years.

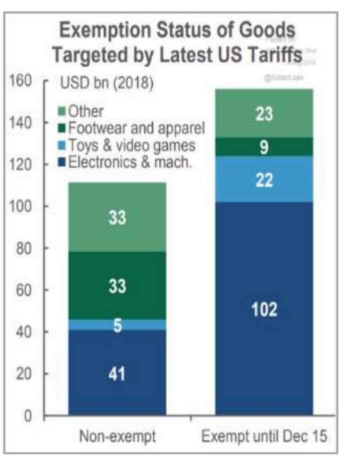
- **U.S. import prices** rose 0.2% in July as a rebound in the cost of petroleum products offset declines in prices for capital goods and motor vehicles. Prices for fuel imports rose 1.8%, while prices for non-fuel imports fell 0.1%. U.S. export prices rose 0.2% in July.
- **The U.S. unemployment rate** was unchanged at 3.7% in August, remaining near its 50-year low. The U.S. economy added 130,000 jobs to payrolls but manufacturers added only 3,000 employees, continuing a tepid run this year. Overall, the job market was on slightly weaker footing than expected. For the three months ended in August, average monthly payroll growth was 156,000, down from an average 190,000 a month in the eight years since jobs started growing after the last recession.
- **U.S. retail sales** climbed a healthy 0.7% in July, the strongest reading since March. Online retailers, grocery stores, clothing retailers and electronics and appliance stores all reported strong gains. Sales in one category that is mostly made up of online retailers jumped 2.8% in July, likely boosted by Amazon's Prime Day sale. Online sales have soared 16% in the past 12 months, compared to a 3.4% rise for overall retail sales.
- **U.S. consumer prices** rose at a robust pace in July boosted by higher prices for energy and most other goods and services. The CPI climbed 0.3% from June and 1.8% from July 2018. The core CPI was up 0.3% in July from June and 2.2% from a year earlier.
- **U.S. household sentiment** dropped to a seven-month low in August, as consumers feared the implications of trade uncertainties and the Fed's recent rate cut. The University of Michigan preliminary index of consumer sentiment for August was 92.1, down from July's 98.4. An index on sentiment about current economic conditions fell to its lowest level since 2016.
- **The Leading Economic Index (LEI)** rose 0.5% in July after two straight declines, and all signs still point to moderate growth in the second half of 2019, the Conference Board reported.
- **U.S. producer prices** rose 0.2% in July and 1.7% in the 12 months through July. The core PPI dipped 0.1% in July after an unchanged reading in June. Wholesale energy prices rebounded 2.3%, boosted by a 5.2% jump in gasoline prices. Goods prices increased 0.4%. The cost of services fell 0.1% in July, the first decrease since January, after rising 0.4% in June.
- **The U.S. economy** appears poised to enter a recession within two years. According to a new survey of business economists, 72% of economists predicted that a recession would occur by the end of 2021, up from 67% in February. The new figure combines the 38% of economists that expect a recession to strike in 2020 with the 34% that see one befalling the economy in 2021.



Key Update: U.S. GDP increased at a 2.0% annualized rate in the 2nd Qtr, revised down from the 2.1% pace estimated in July. The economy grew 3.1% in the 1st Qtr and 2.6% in the 1st Half.

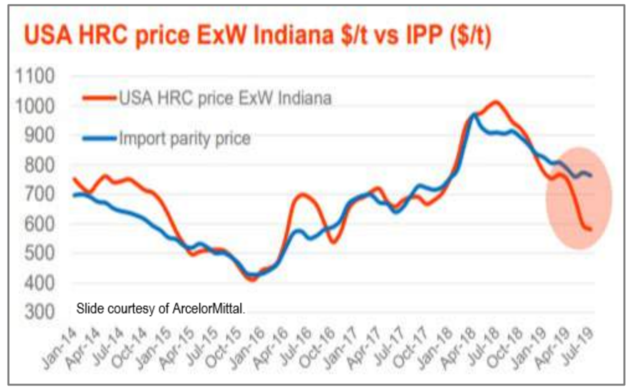
- **U.S. industrial output** declined 0.2% in July with manufacturing losing 0.4%, tugging down broader output across factories, mines and utilities. Manufacturing output accounts for about 75% of the nation's total industrial output and has fallen more than 1.5% since December 2018. July utility production rose 3.1%; output in the mining sector fell 1.8%. The mining index, which includes oil and natural gas extraction, was up 5.5% from a year earlier.
- **Durable goods orders** rose 2.1% in July, led by transportation, with a 47.8% surge in aircraft and parts that was mainly due to Boeing orders. Excluding that sector, orders fell 0.4%. Orders for non-defense capital goods, rose 0.4% in July. Shipments of non-defense capital goods fell 0.7%, the largest drop in three years. Orders for machinery, primary metals and fabricated metals declined, pointing to continued weakness in business investment and a slowdown in economic growth in the 3rd Qtr.
- **U.S. factory orders** rose for a second straight month in July as transportation equipment orders increased by the greatest degree in nearly a year. Factory goods orders jumped 1.4% compared to June and gained 0.4% over July 2018. Pointing to underlying weakness in the sector, which accounts for about 11% of the economy, shipments of manufactured goods fell 0.2%.
- **The ISM index of factory activity** fell to 49.1, the lowest reading since August 2016. The new-order measure dropped to 47.2, a seven-year low suggesting that tariffs are dampening demand for new products from U.S. producers. It was the first time the gauge has indicated contraction since December 2015.
- **The ISM nonmanufacturing index activity** rose to 56.4 in August from 53.7 in July, the 115 straight month of expansion. Business activity and new orders accelerated in August after cooling in July. Employment growth in service industries softened in August from the month prior.

- **The U.S. housing market** continued to struggle in July as new housing starts dropped 4.0% to an annual rate of 1.191 million units. Existing home in July sales expanded 2.5% to an annual rate of 5.42 million. The average interest rate on a 30-year fixed-rate mortgage was 3.77%, down from 4.46% six months earlier. New home sales fell 12.8% to an annual rate of 635,000. The growth of home prices continued to decelerate, the latest sign that lower mortgage rates are providing little boost to a housing market that has slowed for the past year. Average national home prices grew 3.1% in the year ending in June. One year ago housing prices were rising three times faster at 6.3 percent.
- **Construction spending** ticked up just 0.1% in July to a $1.29 trillion annual rate. State and local governments accounted for most of the gains as spending on school construction rose, but federal construction spending fell 2.4%. So far this year, construction spending has tumbled 2.1%, dragged down by a sharp pullback in expenditures for homebuilding.
- **Government agencies** in recent weeks have substantially lowered their estimates of job gains, output growth and corporate profits since early 2018 through the 1stQtr of this year, as part of their regularly scheduled updates. Employers added about two million jobs in the year through March, down 501,000 from a prior estimate. That brought down the average monthly gain over that period to about 168,000 from 210,000. The 12-month job gain was a substantial 20% lower than the prior tally, a larger-than-usual annual revision.
- **Federal deficits** are projected to grow much more than expected over the next decade. The CBO increased its forecasts for deficits over the next decade by $809 billion to $12.2 trillion. The increase primarily reflects higher federal spending under the new budget deal, partly offset by lower projected interest rates.
- **The White House** abruptly suspended plans to impose new tariffs on about $156 billion in goods from China. The reprieve postponed until Dec. 15 tariffs of 10% on smartphones, laptops, toys, videogames and other products set to take effect on September 1. Tariffs on other items, including tools, apparel items and some footwear went into effect on September 1. Those goods had a value of about $107 billion last year. (See China on page 7 for subsequent tariff developments and Appendix: *Steel*, page 9.)



Key Update: Tariffs have added to concerns about the two largest economies. A key recession warning - yields on short-term U.S. bonds eclipsed those of long-term bonds - flashed in mid-August for the first time since the global financial crisis.

- **U.S. steel mills** shipped 7.718 million tons of steel in June, a 5.2% drop from May and a 3.4 % decrease from a year ago. Steel mill shipments year-to-date to June stand at 48.223 million tons, up 1.9% vs. 2018 shipments of 47.304 million tons for six months.

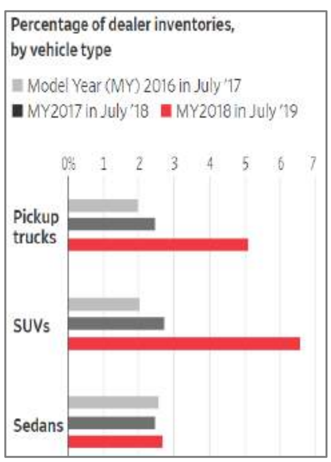


Key Update: Steel price declines coupled with high raw material prices have compressed steel spreads. U.S. HRC prices have fallen to levels well below import price parity.

- **U.S. raw steel production** for the year-to-date through August was 65.313 million tons at a capability utilization rate of 80.8%. That output was up 4.1% from the 62.723 million tons produced during the same period in 2018 at a utilization rate of 77.3%.
- **Steel imports into the U.S.** were 3.028 million tons in July, including 1.843 million tons of finished steel, up 48.3% and 6.6% respectively vs. June's final numbers. For the first seven months of 2019, total and finished steel imports were 18.666 million and 13.536 million tons, down 10.6% and 16.4% respectively vs. the same period in 2018. Finished steel import market share was estimated at 19% in July and 21% year-to-date.
- **Stainless steel prices in the U.S.** have been pushed higher by gains in August stainless surcharges with base prices reported to be flat and unlikely to change in the near term. Surcharges climbed by 15.8% during July, spurred by rising nickel prices on the LME, and ended the month at $6.50 lb. A similar increase may occur in September. The LME nickel price stood at $8.01 lb. at the end of August, up 21% from the start of the month.

  Key Update: Stainless steel scrap prices in the U.S. continued to climb in August, following the rise of nickel prices on the LME.
- **U.S. Steel** plans to idle its East Chicago tin mill in northeast Indiana by November resulting in layoffs of 150 employees. USS said high levels of low-priced imported tin mill products have forced it to consolidate its tin mill products production from three to two facilities at its Gary and Midwest plants in Indiana. USS will also lay off hundreds of workers at its Great Lakes mill in Michigan in the coming weeks for as long as six months or more, following its decision to halt production at that Michigan facility. Meanwhile, ArcelorMittal will lay off 100 workers at its Weirton tin mill in West Virginia. MT also cited imports for its decision, as well as the ongoing decline in the tin can market, as supermarkets devote more space to fresh food instead of canned goods, reflecting shifting consumer demand.

- **Iron ore prices** posted their biggest one-month drop in eight years as China's huge steel engine cools and global shipments of iron ore rise. The price fell 27% to $85.85/ tonne by the end of August, the most since October 2011. The collapse was triggered by global trade tensions, deepened by production slowdowns among the Chinese mills and heightened by concerns over future steel demand. (See Appendix: *Metals*, page 15)
- **Alcoa** reached a tentative agreement with the USW union on a new contract for 1,700 workers at five company plants in Arkansas, Indiana, New York, Texas and Washington. The union members will hold membership meetings in the coming weeks before voting on the agreement. The former contract expired in May, but employees have worked under a temporary extension.
- **U.S. Steel** won't enter into spot market-based adjustable price contracts with its sheet steel customers in 2020 and instead will utilize transaction-by-transaction discussions including monthly negotiations. USS said some of the "volatile and unpredictable" flat-rolled market conditions have been caused by the increased usage of the adjustable price contract mechanisms. One service center called the USS decision "a bomb in the market".
- **The United Auto Workers union** will target GM first of the Detroit Big 3 for talks ahead of the current four-year contract's expiration on September 14. This year's contract talks are expected to be contentious as U.S. new vehicle sales are slowing and automakers face rising costs associated with the development of electric vehicles and self-driving cars.
- **U.S. auto production** is zooming past vehicle demand as inventory piles up at dealerships. Vehicles sales fell 2.5% in the first half of the year as higher prices and more used-car options curbed demand for new cars, leaving an unusually large number of 2018 and 2019 models on lots. Stepped-up factory output of trucks and SUVs has contributed to the glut, and manufacturers haven't adjusted quickly enough to account for slowing sales. Downshifting production to adjust the supply would hit parts makers and freight carriers. Shipments of motor vehicles and parts on U.S. railroads fell 3.7% in July.

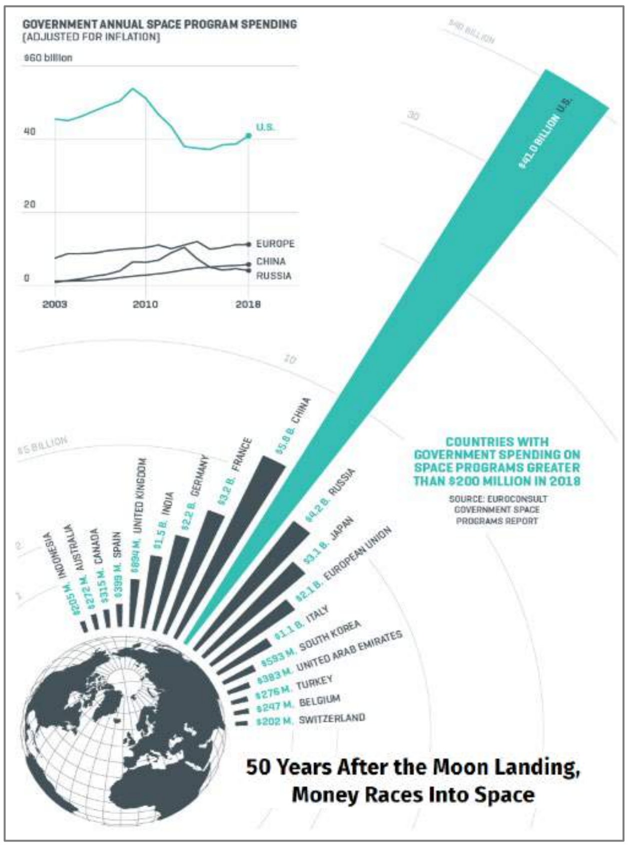


- **The U.S. light-vehicle sales** rose for the second straight month in August, helped by five sales weekends that included the key Labor Day holiday, fatter incentives and higher fleet shipments. Starting in July, Fiat Chrysler joined Ford Motor Co. and General Motors in reporting on a quarterly basis. Analysts said Ford was the only major automaker expected to generate lower sales last month as the company continues to largely exit the sedan market. Without the Detroit 3 and Tesla, industry volume rose about 12.2% in August. (See Appendix: *Automotive*, page 12)
- **The auto parts industry** has chalked up a decade of steady growth, but analysts believe the strains of falling vehicle sales, rising material costs and huge demands for R&D spending could bring the party to an end. Uncertainty over future technologies, lingering import tariffs and unsettled trade issues with key trading partners will erode supplier company values and stock prices, making it harder to keep up current spending. The industry is already in transition, cutting payrolls ahead of any real continued fallout. The sector cut nearly 22,000 jobs in the U.S. through May, or double the same five months of 2018. According to a Deloitte study, segments such as transmissions and axles are expected to decline 6 -10% respectively by 2025. Meanwhile, electric and autonomous vehicle sectors will rise. Electric drivetrains are expected to grow 306%, battery and fuel cell sectors by 266% and advanced driver-assistance systems and sensors by 190%.

  Key Update: *Auto suppliers globaly have created $510 billion in shareholder value since the Great Recession, more than doubling the sector's market value before the recession.*
- **Deere & Co.** reported lower sales for its 3rdQtr and provided fresh evidence of weakening conditions in the U.S. manufacturing sector, saying lower demand for U.S. farm commodities is discouraging farmers from buying its machinery. Deere's quarterly sales of tractors, harvesting combines and other farm equipment fell 6% from a year earlier, and profit from the farm equipment business dropped by 24%. Trade uncertainty, rainy weather delaying spring planting of crops and weakening equipment sales in Canada also contributed to falling equipment sales. In Deere's 3rdQtr, profit declined to $899 million from $910 million last year. Net sales of equipment fell 3%.

  Key Update: *Shipments of recreational vehicles to dealers have fallen 20% so far this year, after a 4.1% drop last year. Multiyear drops in shipments have preceded the last three recessions.*
- **Boeing's deliveries** for the year through July totaled 258 planes, down from 417 planes in the same period a year earlier and the smallest number for that time frame since 2007. Boeing will set aside $5 billion to compensate airlines hampered by the MAX's absence. More than 150 undelivered MAX jets are parked at sites around the U.S., along with the 380 in airlines' hands that were grounded by regulators in March. Airbus shipped 458 planes in the first seven months of this year, putting the European company on track to surpass Boeing as the world's biggest aircraft manufacturer. Boeing said in August it will resume production of its 737 jets at a rate of 52 per month by February 2020 and step up to a record 57 per month in June. The new schedule depends upon regulators approving the 737 MAX to fly again commercially in the 4thQtr. (See Appendix: *Aerospace*, page 11)
- **Lockheed** will keep the F-16 fighter flying with a huge sale to Taiwan. In August, the U.S. Defense Security Cooperation Agency notified Congress of a pending sale of 66 F-16C/D fighter aircraft for a total purchase price of $8 billion.

- Sierra Nevada Corp. chose the Boeing/Lockheed Martin joint venture United Launch Alliance as its resupply partner, and ULA's new Vulcan Centaur rocket as its launch vehicle. Three years ago Sierra Neveda was added by the International Space Station as its third contractor. The Vulcan will carry SN's Dream Chaser spaceplane to the ISS six times in 2021 loaded with up to 12,000 pounds of cargo for the astronauts each trip. The Dream Chaser will return carrying 7,000 pounds of scientific experiments. With help from ULA, SNC will become a key member of the team of companies keeping the ISS in business and will gain a toehold in a space economy that's on the verge of expanding to the moon.



- Washington state regulators in August completed the initial steps toward establishing rules that would prohibit the use of fossil fuels to produce electricity. Currently, 68% of the state's electricity is from hydroelectric sources, 13% coal, 11% natural gas and less than 3% from wind and solar. In May, Gov. Inslee signed into law a bill requiring 100% alternative energy by 2045.
- Renewable energies, for the first time in U.S. history, briefly generated more electricity than coal earlier this year, according to a recent relese from the IEE. This development is significant for clean energy champions, environmental advocates and a coal industry that has long anchored U.S. energy output. Renewable energy sources (e.g., wind, solar, hydroelectric, and bioenergy) have shown to be capable of out-performing coal and are now projected to bump it to third place for the long-term.

(See Appendix: *Energy*, page 11)

- Orbital Marine Power Co. became the latest start-up to receive multi-million dollar backing from the Scottish Government. The firm's floating twin tidal turbine system is one of a string of marine power generation technologies to win the backing of either the Scottish or the UK government. The Floating Tidal Energy Turbine, dubbed the O2, can exploit the flow of the tide in both directions. The £3.4 million grant, part of the £10 million Saltire Tidal Energy Challenge Fund, will be used to build a 72-meter prototype. The 2MW system will then be installed at the European Marine Energy Center in Orkney.

- U.S. carbon dioxide emissions from the power sector have declined 61% between 2006–2014; mainly by switching from coal-to-gas-powered generation. Now the U.S. uses natural gas converted to liquid natural gas (LNG) from shale deposits to transform geopolitics. Lower LNG prices stymie terrorist-financing budgets in Tehran and lower the ability of Russia to weaponize their energy assets for geopolitical intrusions in Ukraine, Crimea, Syria, Central Asia and the Middle East. The U.S. is the world's third largest LNG exporter.
- Fifth Third Bancorp marked the opening of the Aulander Holloman Solar Facility in Hertford County, North Carolina in August. Built by solar developer SunEnergy1, the facility is expected to generate clean power ≥ the amount Fifth Third uses in a year, eliminating 143,000 tonnes of greenhouse gases. Over 350,000 solar panels cover 1,400 acres of the solar facility.

  Key Update: *Solar cells use sunlight to generate electricity, but with rays also comes heat. As the planet warms, temperatures could become too high for solar panels to perform efficiently.*
- Stryker Corp., a Michigan-based company making orthopedics, medical instruments and supplies, pushed into robotics and by 2014 completed seven major acquisitions, including Mako Surgical, a fast-growing manufacturer of robotic arms used by orthopedic surgeons for hip and knee replacement surgery. The Mako system gives surgeons the flexibility to customize and fit the implants, then reestablish alignment with high precision. The result is safer surgeries with better outcomes for patients. At Stryker, those better outcomes are leading to market share gains and better utilization rates for its sought-after robots. In July, the company reported a 9.9% sales increase vs. the previous year.
- Some Medtronic MiniMed insulin pumps were recalled by the FDA because of a risk of them being hacked. The FDA recommended that patients using certain models switch their pump to models better equipped to protect against these risks. Medtronic identified 4,000 patients in the U.S. who could be using the recalled insulin pumps. Medtronic is giving those patients other insulin pumps that have better cybersecurity.

(See Appendix: *Medical*, page 13)

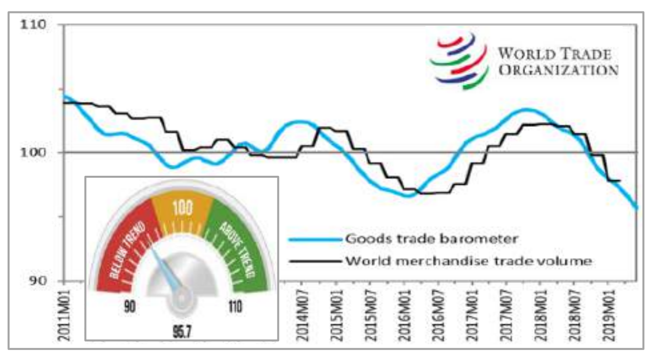
EUROPE, AFRICA & THE MIDDLE EAST

- **The European Union** looks particularly fragile, with a weakening Germany at it core and the mounting prospect of losing the U.K. as a member without a negotiated exit on Oct. 31, Recent eurozone data showed growth in the narrower group of countries that use the euro had all but ground to a halt. In Germany, GDP contracted 0.1% in the 2ndQtr, with economists and government leaders largely blaming the cool-down in Germany's export-driven economy on the uncertainty caused by the U.S.-China trade war and the prospect of an abrupt Brexit.

- **The Eurozone Manufacturing PMI** rose slightly to 47 in August from 46.5 in the previous month, matching the flash reading and market expectations. Still, it was the second-lowest reading since April 2013 and the seventh consecutive contraction in factory activity. New orders continued to decline sharply and output, employment and purchasing activity fell further.
- **ThyssenKrupp** filed a complaint with the General Court of the EU against the European Commission's decision to prohibit the formation of a European flat steel joint venture with Tata Steel. TK said the consolidation of the European steel industry is still right and necessary, which is validated by the current critical market situation for steel manufacturers.
- **The European Commission** reduced the planned increase in tariff-free steel quotas to 3% from 5% to protect against a rise in imports prompted by U.S. tariffs. Top steel executives had urged the EC to scrap or postpone the 5% increase which took effect on July 1, saying the European steel industry was under threat.The Commission also plans to curb any one country from exceeding a 30% share of imports of hot rolled flat steel during a quarter, which may affect Turkey, which has had a large share of imports into the EU. Most notably, Indonesia.has lost its import exemption for hot and cold rolled stainless products in the proposals.
- **Tesla** is scouting out locations for a possible factory in Germany's North Rhine-Westphalia state, and the first inspections have taken place. NRW, Germany's most populous state, shares borders with the Netherlands and Belgium, and CEO Elon Musk said last year that Germany was a leading choice to build a new Gigafactory. Tesla is also looking at Germany's Lower Saxony state, which shares a border with the Netherlands.
- **Outokumpu's 2ndQtr sales** fell 9.6% to €1.701 billion with adjusted EBITDA of €91 million, 33% lower than a year ago mainly due to a 13% drop in stainless steel deliveries. Spot base prices were substantially lower, but Outokumpu's realized prices remained flat, driven by improved customer/product mix. Ferrochrome profitability was negatively impacted by lower benchmark prices. Raw material-related inventory and metal derivative losses were €15 million greater than a year ago.

  Key Update: *Outokumpu expects its 3rdQtr stainless steel deliveries in Europe to be lower compared to the 2ndQtr; Americas deliveries are expected to remain at a stable level.*

  (See Appendix: ***Steel,*** page 10)
- **ArcelorMittal** is attempting to raise prices for hot-rolled coil by €30/ton across Europe, effective for October deliveries. This is the third time this year that MT has tried to raise prices; the previous two tries were mostly unsuccessful, but higher iron ore costs following Brazil's tailings dam disaster in January have squeezed mills' margins for most of this year. Market participants are skeptical that the latest price hike will stick, pointing to declining import price offers and continued low demand for flat products in Europe from automakers and other markets.
- **New passenger car demand** across the European Union fell 3.1% YOY in the first half of 2019. There were 8.2 million new car registrations in the EU in the January–June period, compared with 8.5 million for the same period a year earlier.
- **The growth of world merchandise trade volumes** is likely to remain weak in the 3rdQtr according to the WTO. The latest reading of 95.7 from the barometer is lower than the previous release and signals that stronger trade growth is not yet in sight.

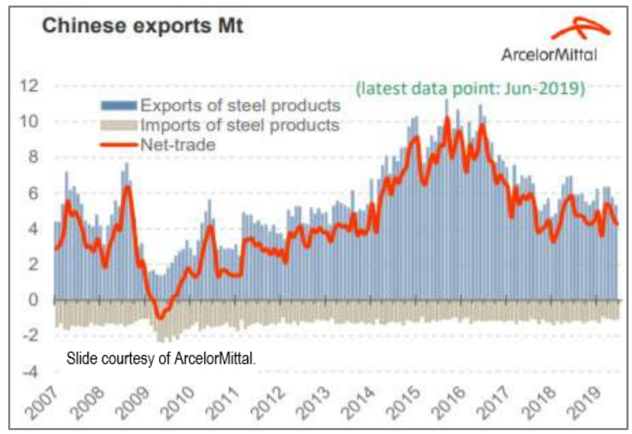


- **Norwegian Ship Owners' Mutual War Risks Insurance** Association (DNK) said war risk premiums are up 10-fold this year, with ships crossing the Strait of Hormuz paying between $300,000 and $400,000 per sailing. Some 20% of the world's oil supply sails on tankers through the Strait of Hormuz.
- **Russian and German scientists** have developed multifunctional metal alloys that absorb and emit heat at the same time and change their volume and size under the influence of a magnetic field. This effect is caused by changes in the structure of the substance. When magnetized, certain bodies change their linear dimensions and volume. These alloys have the potential to be used extensively in medicine and industry.

ASIA/PACIFIC, JAPAN, AUSTRALIA & INDIA

- Japan's exports slipped for an eighth month in July, while manufacturers' confidence turned negative for the first time in over six years. China-bound sales slumped again in a fresh sign the Sino-U.S. trade war could tip the economy into recession. Exports in July fell 1.6% from a year earlier. Exports to China, Japan's biggest trading partner, shrank 9.3% year-on-year in July. The contraction was led by sizable declines of 31.5% in semiconductor production equipment, 35% in car parts and 19% in electronics parts.

- China announced plans to retaliate against the Trump administration with new tariffs on roughly $75 billion worth of U.S. products and reinstated duties on American cars. The Chinese finance ministry said that tariffs of 5% to 10% on more than 5,000 products would take effect in two increments beginning on September 1. The second batch that would include a 25% tax on U.S. auto imports is scheduled for December 15.
  Key Update: *The Trump administration swiftly responded with another tariff increase of its own on the $250 billion of imports already in place, raising the duty to 30% from 25% on Oct. 1. Trump also said the remaining $300 billion of imports set to go into effect on Sept. 1 will be taxed at 15% rather than 10%.*
- Factory activity in China shrank in August for the fourth month in a row as the U.S. ramped up trade pressure and domestic demand remained sluggish, pointing to a further slowdown in the world's second-largest economy. The PMI index fell to 49.5 in August versus 49.7 in July, below the 50-point mark that separates growth from contraction. Export orders fell for the 15th straight month in August, although at a slower pace, with that sub-index picking up to 47.2 from July's 46.9.
- China's producer prices fell into deflation for the first time in three years, as worries over the trade war with the U.S. sapped demand, adding another complication to Beijing's efforts to shore up its slowing economy. As trade tensions with the U.S. escalate, global demand for Chinese goods is expected to erode, further weighing on prices of industrial goods. China's PPI fell 0.3% from a year earlier in July and consumer prices edged up to a 17-month high, squeezing Chinese households' spending power.
- Nickel prices continued to surge after Indonesia expedited a ban on ore exports, raising concerns about shortages of the metal. Indonesia is the world's biggest exporter of nickel ore, a key ingredient in nickel pig iron and stainless steel. But the country is keen to increase the value of the goods it exports and to harness nickel's growing use in electric-vehicle batteries. Miners will not be allowed to sell unrefined ore from January 2020, two years earlier than previously planned. Nickel futures spiked a further 4.6% at $18,760 a ton on the LME on Sept. 2, extending this year's rally to a 76% gain. (See Appendix: *Metals,* page 15)
- Japan's top steelmaker Nippon Steel forecast a 56% drop in business profit in the fiscal year through March 2020, as surging iron ore prices and slumping demand in Asia erode its margins. The world's Number 3 steelmaker forecast earnings at ¥150 billion ($1.4 billion), down from ¥336.9 billion a year earlier. The company has been struggling with rising costs, especially with prices of iron ore, more than doubling since the start of 2019.
- World crude steel production was 156.7 million tonnes (Mt) in July, up 1.7% vs. a year ago. China's crude steel output was 85.2 million tonnes, up 5% from July 2018. The U.S. produced 7.5 Mt in July, an increase of 1.8%. Substantial reductions in output occurred in Brazil with crude steel production at 2.4 Mt, down by 20.7% and Turkey at 2.9 Mt, down 10.6% on July 2018.

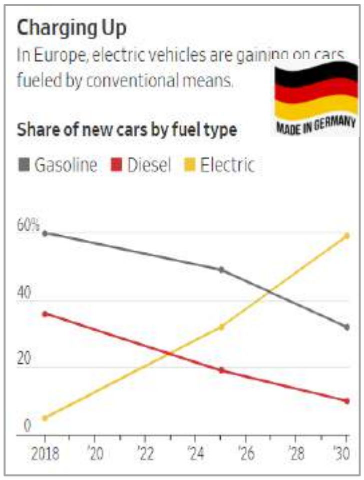


Slide courtesy of ArcelorMittal.

- Australian steelmaker BlueScope Steel will spend US$700 million to expand its U.S. business, joining American rivals that have outlined plans to add capacity locally in the wake of U.S. import tariffs. BlueScope will be able to produce 850,000 more metric tons of steel each year at its North Star business in Delta, Ohio, once the expansion is completed. That represents a 40% increase on current capacity. The North Star plant sells nearly all its steel to customers in the U.S. Midwest, especially automotive and construction companies.
- China's resumption of a 25% tariff on U.S. cars is set for December 15. Beijing earlier waived that duty on light vehicles from the U.S. as part of the efforts to restart trade talks between the two nations. Among automakers, Ford, Tesla and Germany's Daimler and BMW are the most vulnerable to the additional levies. The Chinese auto tariffs were initially imposed by China in 2017, and American exports of finished vehicles dropped by 50%. The following year China imported 190,118 U.S.-made vehicles, down by 35% from a year earlier.
- Tesla raised prices in China ahead of new Chinese tariffs on imported U.S. cars, increasing the pressure on Tesla to fast-track production at its new Shanghai plant. China will apply a higher tariff to U.S.-made cars in December—back up to 40% from 15% after Beijing temporarily lowered the tariff as a goodwill gesture ahead of trade talks. The recent devaluation of the yuan also raised pressure on Tesla to increase prices.

INDUSTRY OBSERVATIONS

- Auto industry consultants Alix Partners predicts fuel-powered cars will make up just 56% of new cars sold by 2030 down from 95% now. The biggest shift will be in Europe, where regulators are pushing tough restrictions on greenhouse-gas emissions. The German Institute for Employment Research predicts that if electric vehicles were to account for just 23% of all new cars sold by 2035, Germany would lose €20 billion in output, or 0.6% of GDP, and 13% of its current auto-industry workforce.



Key Update: There are 309 automotive production and assembly plants across Europe of which 72 are engine plants. Altogether, the sector supports 13.8 million jobs in Europe or 6.1% of total EU workforce and 11.4% of all manufacturing jobs.

- The 'business-as-usual' emissions glide will cost the U.S. 10.5% of its per-capita GDP by the end of the century. Unchecked emissions will hurt all economies by 2100 slowing their retail sectors, crumbling infrastructure, destroying crops, or turning away tourists, researchers at the University of Cambridge reported. Their findings, shared by the National Bureau of Economic Research, belie speculation that wealthier nations might escape the most harmful repercussions of the upward trajectory of carbon emissions or that warmer temperatures could actually benefit industrialized northern nations. All told, a persistent increase in average global temperature of 0.04°C per year, in the absence of mitigation policies, will reduce world real per-capita GDP by 7.22% by 2100. Abiding by the Paris Climate Agreement, thereby limiting the temperature increase to 0.01°C per year, reduces the loss substantially to a 1.07% reduction to inflation-adjusted per-capita GDP by 2100.
- Further U.S. escalation in the trade war may occur, according to BofA Merrill Lynch, but its baseline is that there will be only modest additional measures on various fronts. However, there is substantial risk that the recently announced 10% tariff could get increased to 25%. At that point there would be 25% tariffs on all Chinese imports. The firm thinks there is a high risk of tariffs on imports of autos and parts from outside North America (with South Korea also likely getting an exemption), particularly as such tariffs would incentivize producers to meet the USMCA's stricter local-content rules. There could also be measures against other countries that are benefiting from shifting supply chains, have large and growing trade surpluses with the U.S. or are allowing Chinese goods to evade U.S. tariffs via trans-shipment. The first target among such countries would likely be Vietnam.

U.S. LIGHT VEHICLE SALES & INVENTORY LEVELS AUGUST 2019

Company	Sales	Inventory
General Motors		90
Ford Motor Company		84
Fiat / Chrysler		84
Toyota	248,334	55
Honda	173,908	70
Nissan Group	135,369	66
Hyundai / Kia	112,337	48
VW Group	61,980	95
All Cars Sold		64
All Trucks Sold		73
Total All Cars & Trucks Sold		71

Note: Table reflects U.S. sales for manufacturers that continue to report monthly. GM, Ford and FCA now only report sales quarterly. Inventory is shown in 'Days-will-Last' as of the first day of the month.

Perspective

Total industry days supply on August 1

2015	59
2016	61
2017	69
2018	66
2019	**71**

Source: Automotive News Data Center

Domestics vs. imports

Days supply on August 1, 2019

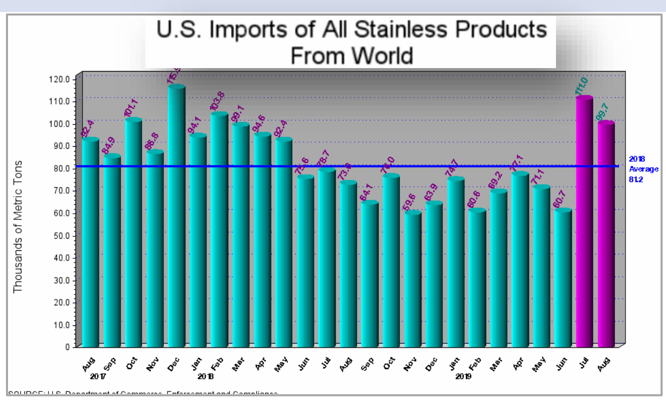
	On Aug. 1	On July 1
Detroit 3	86	79
European	71	65
Japanese	59	64
Korean	48	45
Total Industry	**71**	**69**

Source: Automotive News Data Center

CURRENCIES IN SEPTEMBER

From	To	Rate	From	To	Rate
USD	¥en	107	USD	Korean Won	1,181
CAN $	USD	.7563	Chinese Yuan	USD	.1471
€uro	USD	1.1033	Australian Dollar	USD	.6837
UK £	USD	1.2330	Mexican Peso	USD	.0522

U.S. IMPORTS ALL STAINLESS PRODUCTS AUGUST 2019



SOURCE: U.S. Department of Commerce, Enforcement and Compliance
Graph last modified on : August 20, 2019 with
Licensing Data collected through August 20, 2019
Commerce license data used for the last months appear in a different color

ECONOMIC UPDATE · APPENDIX TO SEPTEMBER 2019 REPORT

STEEL: AMERICAN STEEL TARIFFS CUT BOTH WAYS FOR DOMESTIC STEEL PRODUCERS

U.S. tariffs of 25% on steel imports, imposed in March last year, briefly returned the domestic industry to health. A year ago a tonne of hot-rolled coil, an industry benchmark, which sold for roughly $600 in America at the start of 2018, fetched over $800 by the summer. Volumes that American steelmakers shipped domestically rose too, by 5% in 2018 compared with the previous year. Today, steel prices have slumped back to pre-tariff levels. Although the price of iron ore, from which a third of American steel is smelted, has tumbled in the past month, it remains roughly double what it was a year ago. Steelmakers' profits collapsed. Nucor, U.S. Steel and Steel Dynamics, the country's three biggest producers, all reported a steep fall in 2nd Qtr earnings. The industry's share prices languish a fifth below their level a year ago (see chart). A recent presidential promise to force federal agencies to buy steel with at least 95% domestic content, up from a minimum of half today, is unlikely to change things. It could even make matters worse. The reason is economics: By raising domestic prices the tariffs distorted incentives. The extra cash, combined with an apparent rise in demand, induced steel companies to splash out on new capacity. Bank of America Merrill Lynch estimates that **by 2022 the projects currently in the works could increase output by the equivalent of a fifth of America's steel consumption in 2017.** There may be nowhere for all the extra steel to go. Demand is now likely to grow at its underlying rate of 1-2% a year, estimates investment bank UBS. With factory activity slowing, as it did in July for the fourth straight month, demand for steel is slipping, too. U.S. Steel has acknowledged that "market conditions have softened". *The Economist*

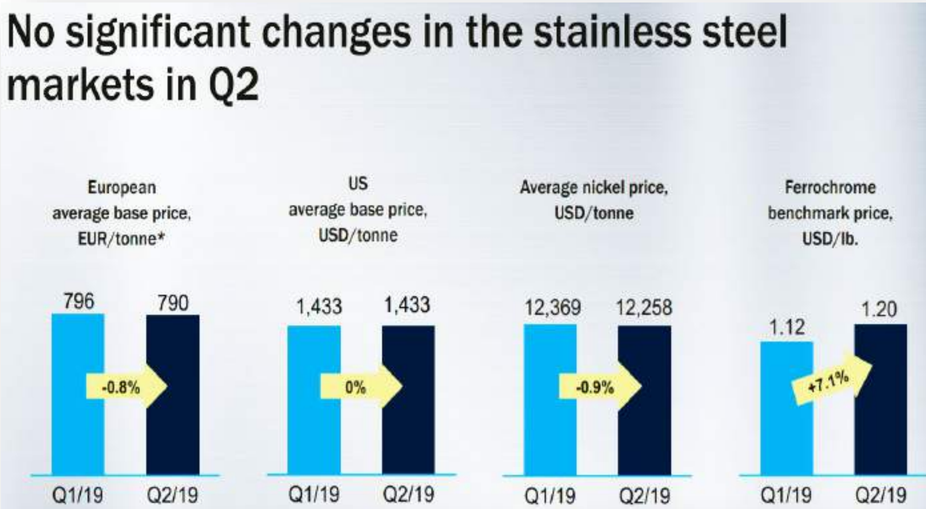
STEEL: STAINLESS STEEL STRAW COULD BECOME A SUPERIOR CHOICE VS. SINGLE USE PLASTICS

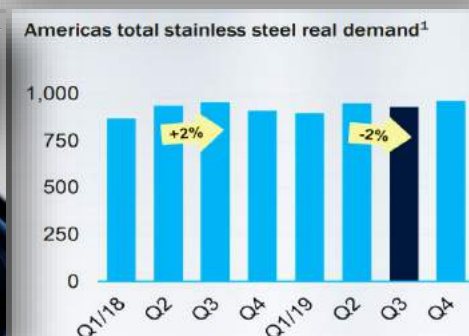
Every day, billions of plastic drinking straws are discarded across the world. In the US alone, it's estimated that upwards of 170 million drinking straws are used and thrown away daily. Over the past year, however, a public backlash against single-use plastic has started to gain global momentum, and it seems that the era of the plastic straw will soon be behind us. So what will replace it? FinalStraw is a startup based in Santa Barbara, California and its founders believe they have the answer to this question: A new, alternative straw product that makes use of steel's physical and sustainable properties. The FinalStraw drinking straw is the world's first collapsible metal straw and it's built to last, withstanding up to two folds per day for 15 years. Because it's collapsible, it's carried easily in a pocket, handbag or as an attachment to car keys. It's available in two colors, stainless or rainbow, and each one comes with a specially-designed cleaning sponge.

The FinalStraw drinking straw is the world's first collapsible metal straw and it's built to last, withstanding up to two folds per day for 15 years

Stainless steel is fundamental to the straw's design as it can be repeatedly and reliably sanitized due to its non-porous and corrosion-resistant properties. This allows for repeat cleaning without any physical impacts on the straw's surface and gives it a resilient and stylish aesthetic. Millennial entrepreneurs Emma Cohen and Miles Pepper came up with the idea, and their company FinalStraw, after mutual friends introduced them in October 2017. Emma and Miles chose to make their product out of stainless steel for two main reasons. Firstly, it's a strong, versatile and hygienic material that doesn't rust – vital qualities for a reusable straw. Secondly, steel is one of the more environmentally friendly metals to mine and is 100% recyclable. The entrepreneurs were keen to ensure all the choices they made were sustainable. This is why they chose recycled paper for the product packaging too. In 2019, under the parent company Final Co, the FinalStraw founders will release a new product line called Foreverables, intended to replace single-use utensils.

STEEL: OUTOKUMPO AUGUST OUTLOOK ON THE STAINLESS STEEL MARKET

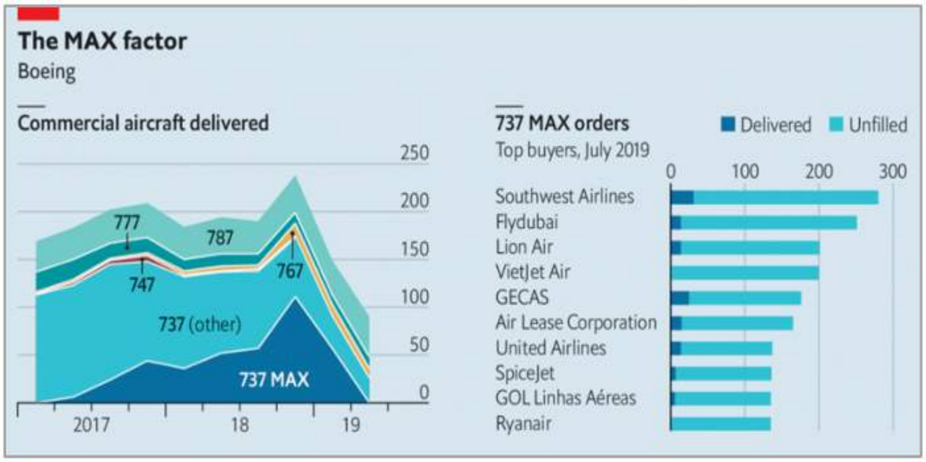




STEEL: OUTOKUMPO PROJECTS STAINLESS STEEL DEMAND EXPANSION TO 2024

Stainless steel is not a single product and there are thousands of different grades and product forms. They can be divided to flat and long products or semi-finished products, rolled products and products finished by additional opetations.

AEROSPACE: BOEING'S TROUBLES COST THE AEROSPACE INDUSTRY $4 BILLION A QUARTER



Boeing has continued to churn out the troubled aircraft since its grounding by regulators in March. But it has not been able to deliver them to customers. As a result Boeing's inventories have grown by $6 billion so far this year. The flightless planes fill all free space at its facilities, including car parks. The knock-on cost for airlines and for the supply chain and a rough estimate is that every quarter that the best-selling airliner remains on the ground costs $4 billion. As the bill spirals an entire industry is now willing the plane to be back in the air by the end of the year.

ENERGY: WITHOUT SUBSIDIES, WIND AND SOLAR ENERGY PROJECTS COMPETITIVE WITH GAS

Bank of America Merrill Lynch

Chart 13: So far, wind generation has primarily replaced coal in Texas…

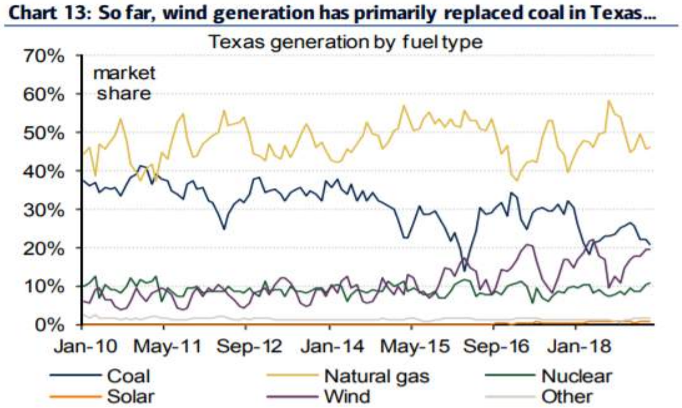
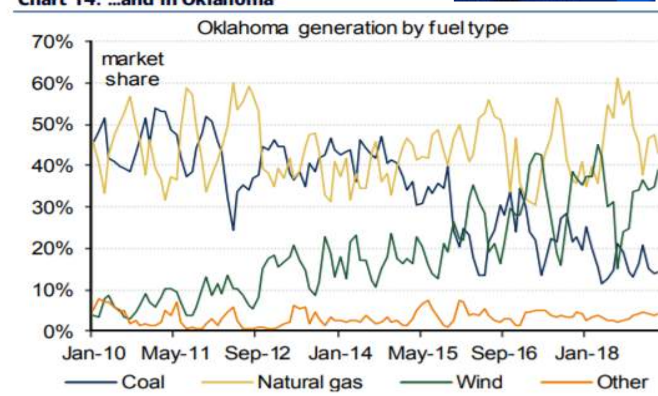


Chart 14: …and in Oklahoma



Legacy subsidized wind projects should lead to an influx of wind capacity over the next 18 months, and the solar projects qualifying for tax credits this year should result in solar capacity growth to the end of 2023. Meanwhile, technology and cost improvements in both wind and solar have driven down their respective leveled cost of energy. As a result, even without subsidies wind and solar projects are currently competitive with U.S. natural gas.

Chart 15: As solar tariffs decline…

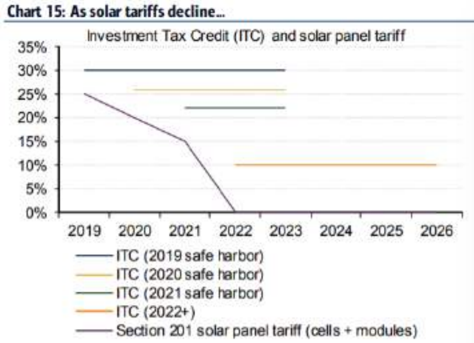
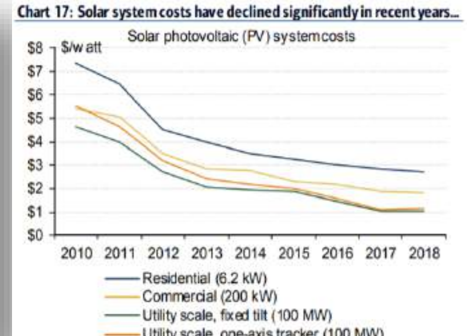


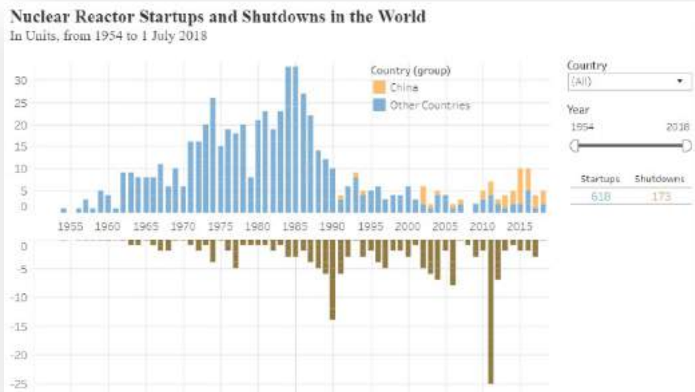
Chart 16: …we expect solar project completions to increase

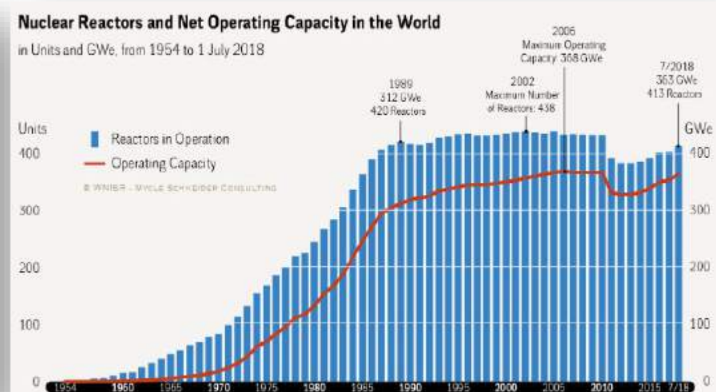
Chart 17: Solar system costs have declined significantly in recent years…

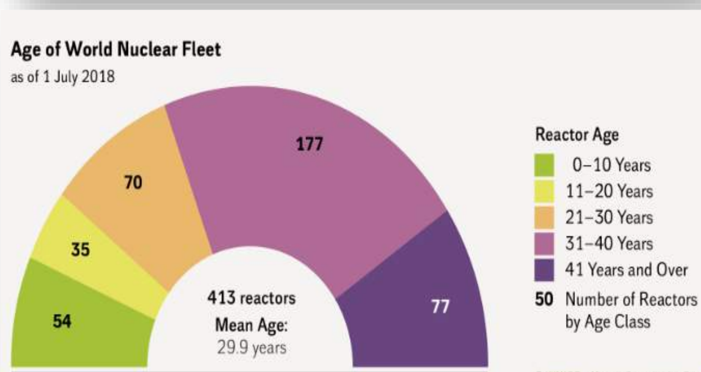


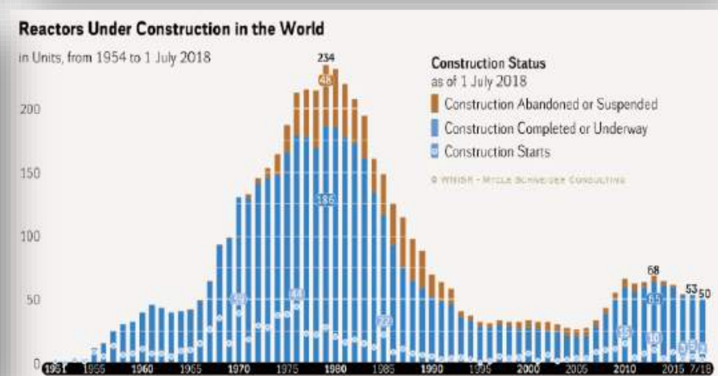
2019 is a big year for U.S. solar since this is the last year that projects can qualify for full federal investment tax credits (ITC). Projects qualified (or safe harbored) in 2019 must be placed into service by the end of 2023. Meanwhile, solar panel tariffs are 25% this year, but are scheduled to step down over time. On a national level, the optimal completion schedule for safe harbored solar projects is 2022-23 in order to maximize the ITC and minimize tariffs. However, Texas solar projects are incentivized to enter service before tariffs roll off due to low reserve margins. For now, Texas has avoided the over-build of solar that plagued California. California realizes high intra-day price volatility and must rely on expensive fast response energy resources during the morning/evening when solar is ramping up/down.

ENERGY: THE WORLD NUCLEAR INDUSTRY STATUS REPORT – REACTOR STARTUPS CLIMBING IN CHINA



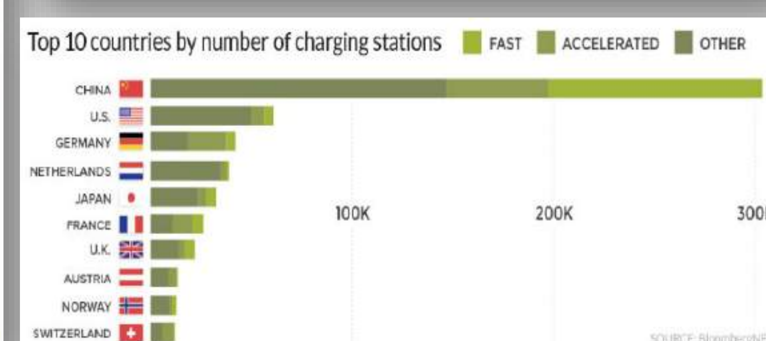




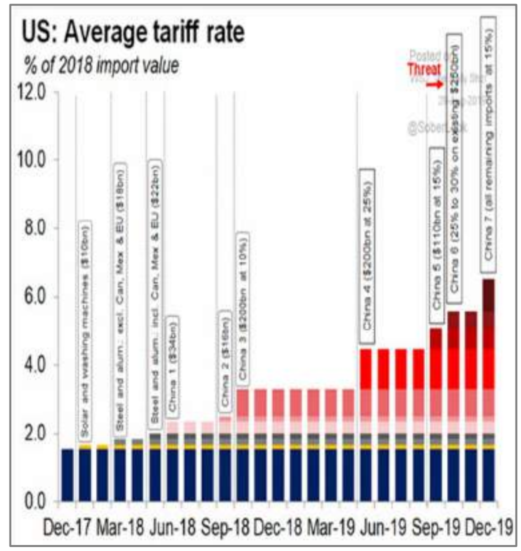


AUTOMOTIVE: VISUALIZING ELECTRIC VEHICLE SALES GROWTH AROUND THE WORLD

It took five years to sell the first million electric cars. In 2018, it took only six months.



MEDICAL: TARIFFS AND TECHNOLOGY IMPACT MEDICAL DEVICE INDUSTRY



The medical device industry already has felt the sting of the trade war between the U.S. and China which may worsen if negotiations fail. The industry is paying tariffs of up to 25% on $860 million in Chinese imports and nearly $5 billion in exports, according to AdvaMed, the medical device lobbying group. While a small number of medical devices were exempted from the 25% tariffs in July, many were not. Products affected by the 25% tariff include imaging equipment, diagnostic reagents used in X-ray exams and dental drills. The tariffs also affect the aluminum and steel used to make many medical devices. President Trump's administration imposed a tariff of at least 10% on nearly all Chinese imports beginning Sept. 1, but the president said that rate could be raised to as much as 25% on the $300 billion in Chinese imports that haven't been affected by the trade war. An expansion of imports subject to the tariff would add even more medical devices to the list. The trade war has been particularly hard on device manufacturers with supply chains between U.S. and China because they are hit with huge tax bills. It is common that products will be imported from a manufacturer in China to their manufacturing facility in the U.S., where they are substantially transformed by and re-exported – often to China. Taxing these products on both ends of the supply chain is a disincentive to manufacture in the U.S. Medical device suppliers may also be affected if China retaliates and increases tariffs on U.S. imports. Currently, the U.S. makes up more than 30% of China's medical device and diagnostics imports.

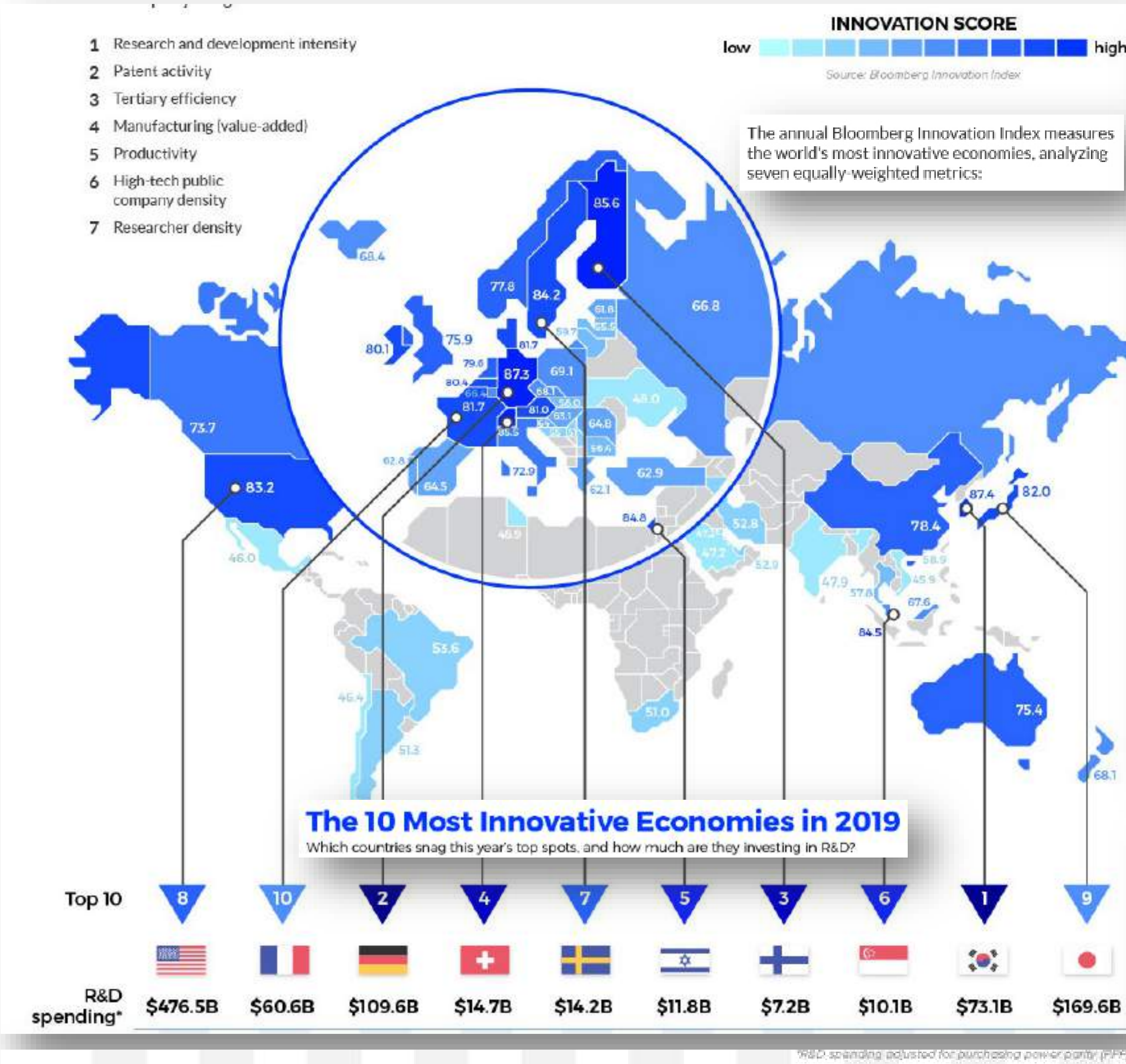
The concept of portable and convenient technology has been taken a step further with microchip implants. In Sweden, thousands have already implanted microchips into their bodies. The Swedish firm, Biohax International, currently dominates this market and asserts that chip implants can help streamline

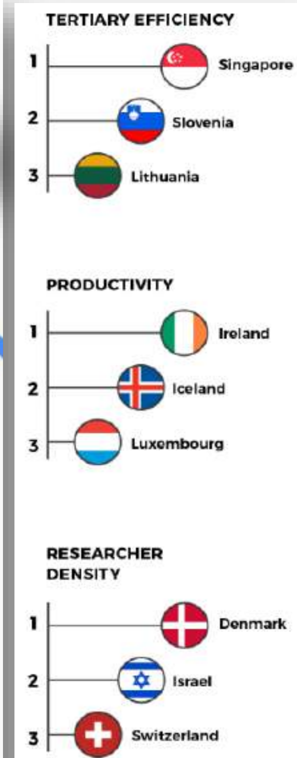
everyday tasks through enhanced connectivity. The chips offered by Biohax are designed primarily to reduce the time it takes users to perform specific daily routines. Individuals with implants can access their homes, offices, and gyms by simply swiping their hands against a digital reader. Biohax chip implants can also be used to store emergency contacts, social media profiles, house keys/FOBs, and even e-tickets for events and public transportation. In 2017, government-owned passenger train company SJ became the first travel company in the world to allow people to use microchip implants in lieu of paper train tickets. Biohax has also implied that users will soon be able to use the chips for store and restaurant payments. While using microchip implants for convenience is certainly cutting-edge, perhaps the biggest proponent for this type of technology is its potential to revolutionize health monitoring and medical diagnosis. The trend has even caught on the U.S. with Three Square Market, a Wisconsin based vending-solutions company, surgically implanted chips into more than 50 volunteers employed at the company.

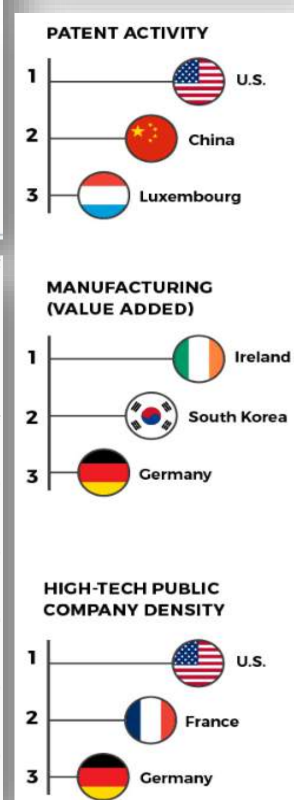
The first-ever implantable continuous glucose monitoring system, the Eversense CGM (Senseonics), was approved by U.S. Food and Drug Administration (FDA) in 2018 for people aged 18 years and older with diabetes. The device consists of a fluorescence-based sensor that is implanted subcutaneously in the upper arm by a physician in a short office procedure, a transmitter worn above the sensor, and a mobile app that displays glucose values and trends and issues alerts to high and low blood glucose values. The transmitter also sends on-body vibration alerts. In contrast to current continuous glucose monitors (CGMs) that need to be replaced every 7 to 14 days (typically by patients themselves or caregivers), the Eversense lasts up to 3 months, after which it must be removed in another short office procedure by a physician and replaced on the opposite upper arm. According to information presented at an FDA advisory panel meeting, the Eversense is indicated for adjunctive use, meaning the user still needs to perform fingerstick monitoring for treatment decisions, as well twice-daily calibrations, unlike some other CGMs on the U.S. market.

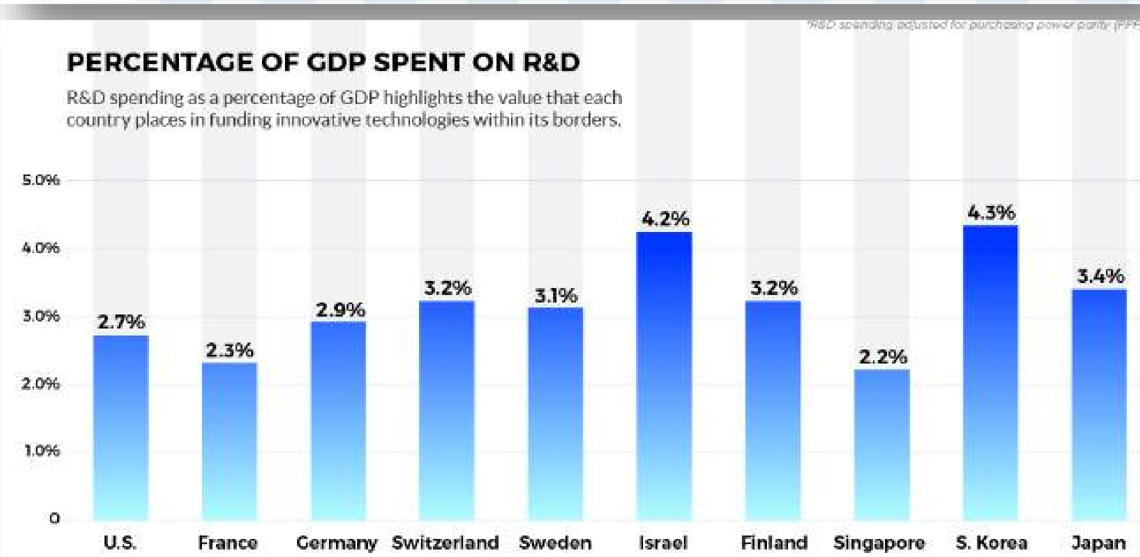
The startup Z Imaging was founded by classmates at Harvard who were curious about medical technology. Their company develops augmented reality (AR) toolkits that can be used to power applications in medicine and industry. Using computer vision and other machine learning techniques, they created software that can perform highly accurate alignment between the virtual and real worlds with only sub-millimeter errors. Z Imaging's software development kit enables developers to build custom AR tools that seamlessly fuse 3D images with actual physical objects. The co-founders are also exploring the development of packaged solutions for specific industries, such as the aerospace sector. In aircraft quality control, for instance, an AR-based interface could provide a technician with process instructions and important information about different aircraft components. It could also enable a worker to overlay virtual images of undamaged parts to identify defects. The firm recently secured its first client—a company that is developing an AR-guided surgical system—and they are working with other potential customers, including a major Chinese hospital and an aircraft manufacturer.

INNOVATION: THE WORLD'S 10 MOST INNOVATIVE ECONOMIES

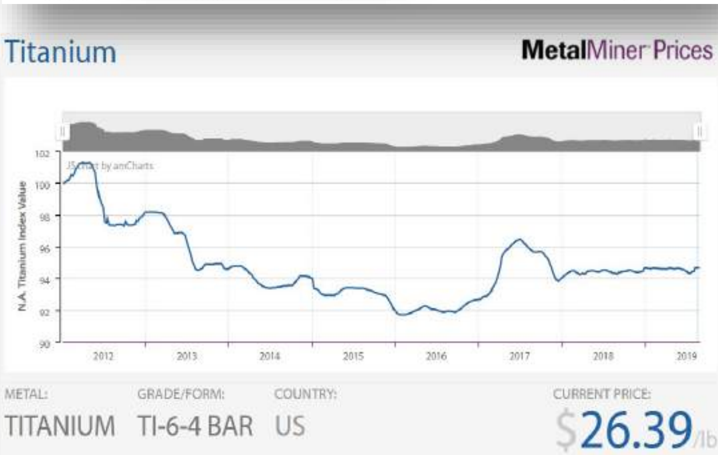


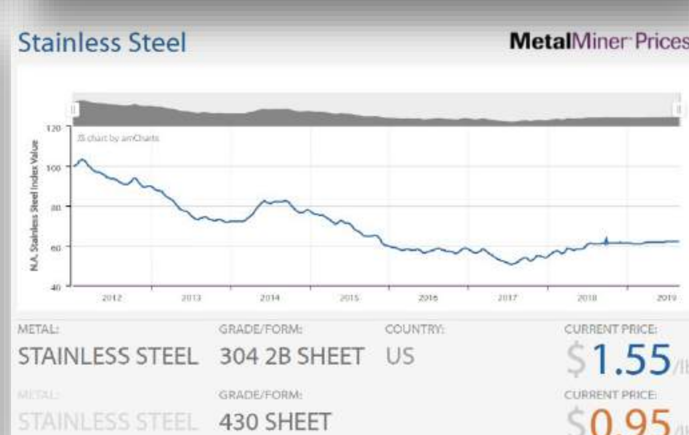


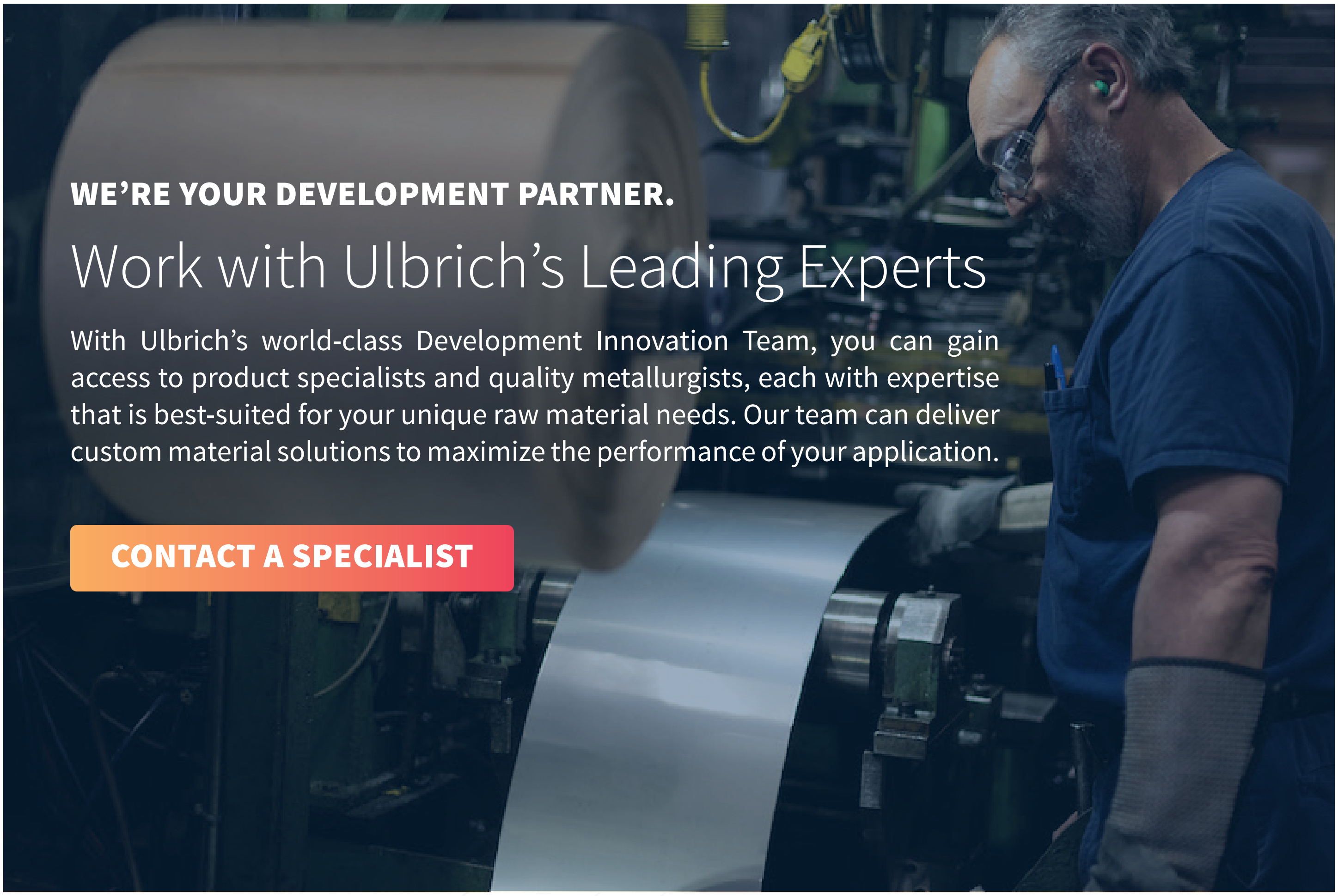




METALS: COMMODITY PRICES – NICKEL, ALUMINUM, COPPER, TITANIUM, STAINLESS STEEL & IRON ORE







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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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