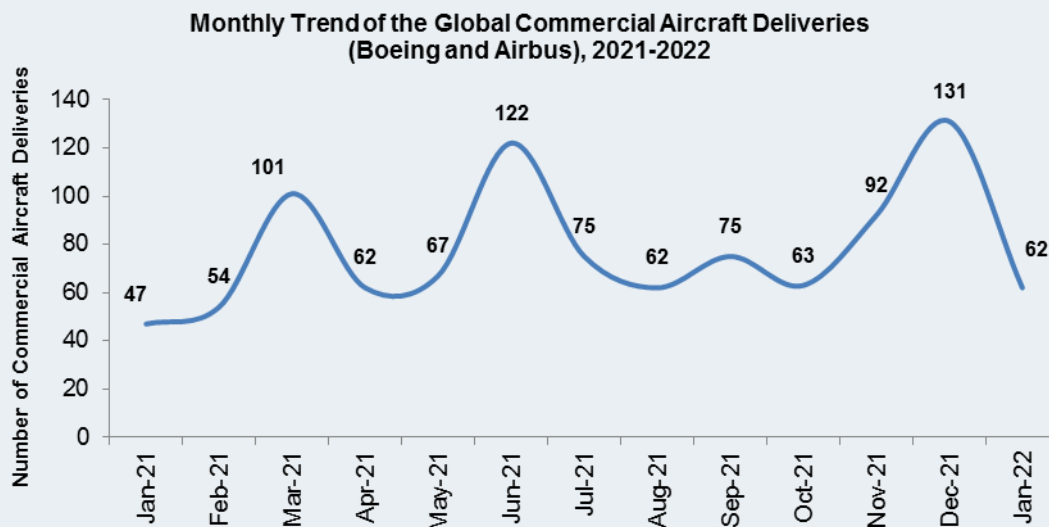


Composites Market Update for January 2022

The composites market in January of 2022 performed at roughly 5-6% above the previous year, continuing the strong trend from late 2021. Slight improvements in distribution helped to keep performance high, though raw material and finished goods transportation remain the biggest challenges in reaching the full market demand as we begin the new year. Marine, construction and infrastructure all performed quite well, and no industry performed particularly poorly. February's performance is expected to be in line with the daily sales trends seen in January, which will mean that February should end significantly higher than the previous year, when a major snowstorm had a major impact on production and distribution. Raw material availability is improving, but is not sufficient to meet the demand, and as a result, prices continue to increase slowly with no sign of decreasing in the near term. Certain external factors may impact the industry, including potential interest rate increases in 2022, which may impact the strong housing market, and related building and construction sectors. The conflict in Ukraine may impact access to petroleum resources from Russia, which could impact the cost of certain raw materials. However, demand is expected to remain high in the foreseeable future.

Aerospace

Commercial aircraft (Boeing and Airbus) deliveries decreased from 131 aircraft deliveries in December 2021 to 62 aircraft deliveries in January 2022.



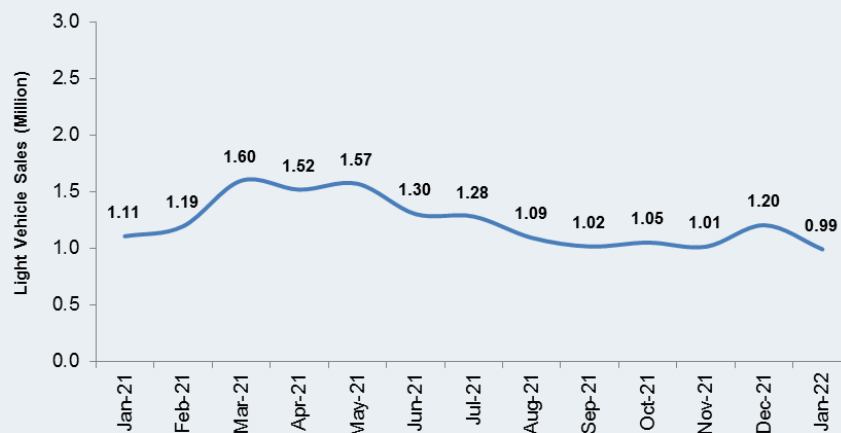
Some highlights of January 2022 are as follows:

- MS-21-300 Debuts First Flight with Carbon Fiber Wing.** MS-21-300 aircraft, the wing of which is made of Russian-sourced carbon fiber, made its first flight from the airfield of the Irkutsk Aviation Plant. The share of composites in the MS-21 design is about 40%, which is a record figure for medium-haul aircraft. The use of strong and lightweight composite materials has made it possible to create a wing with unique aerodynamic characteristics unattainable for a metal wing.
- Portable and Digitized Composite Part Repair.** AGFM's portable scarfing/composite repair system (PS/CRS) concept is developed for fast, on-site scarfing of damaged composite aircraft components. It also works together with NIAR-developed software to capture data for more accurate scarfing and patch development, and to create a digital thread of repair information about each part or aircraft.
- Business Partner Agreement between Park Aerospace Corp. and ArianeGroup SAS.** Park Aerospace Corp. has entered into a Business Partner Agreement with ArianeGroup SAS of Les Mureaux, France. Under the Business Partner Agreement, ArianeGroup SAS appointed Park as its exclusive North American distributor of ArianeGroup's RAYCARB C2B NG proprietary product. RAYCARB C2B NG is used to produce ablative composite materials for critical rocketry and missile systems.

Automotive

The U.S. new vehicle sales of 991,156 units in January 2022 represented a decrease of 10% as compared to 1,106,286 in January 2021.

Monthly Trend of Light Vehicle Sales in the US, 2021-2022



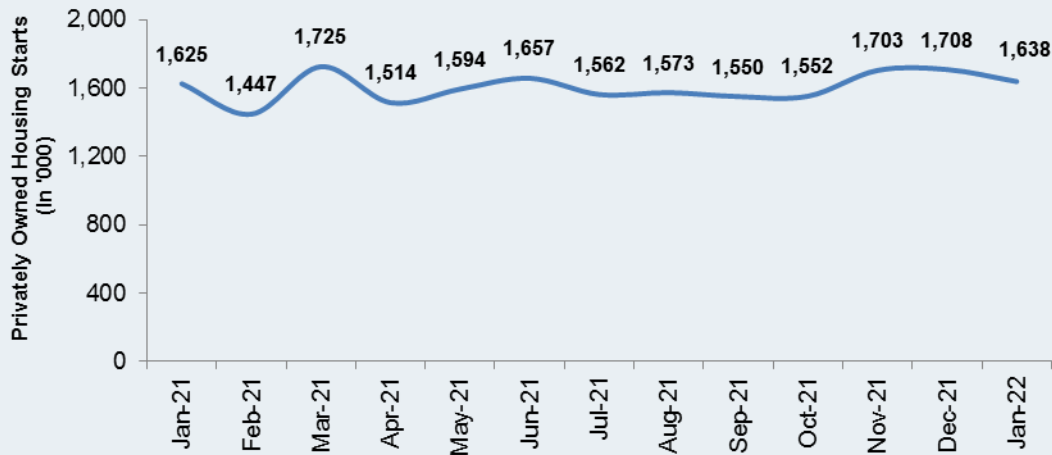
Some highlights of January 2022 are as follows:

- **Fras-le Introduces Composite Materials Line for Brazilian Auto Parts Manufacture.** Fras-le Smart Composites will enable the production of components with better performance and weight reduction up to 65%, with an eventual goal to extend beyond automotive. Now, Fras-le Smart Composites will reportedly be one of the first to take the initiative of implementing composites for auto parts in the Brazilian road market. With this movement, the company follows the direction of technological megatrends in the mobility sector and aligns its portfolio to the public sustainability commitments signed with a focus on ESG
- **Envisioning High-Volume, 100% Composite Wheels.** Wheel manufacturer Vision Wheel sees high potential for carbon fiber wheels in future electric and high-performance vehicles. Working with partners IDI Composites International and A&P Technology, the company has developed its first composite wheels using what it says is a high-volume process with low-cost materials.
- **University of Iceland Develops Process for Manufacturing One-Piece Racecar Airfoils.** Airfoils, also called wings, are a staple aerodynamic component on racecars. These components, often made from composite materials, are designed to control airflow around the back of the vehicle, with the goal of enabling the highest speed possible.
- **OCSiAl Launches Graphene Nanotube Concentrate for High-Quality Thermoplastic Auto Parts.** OCSiAl's TUBALL MATRIX 822 graphene nanotube concentrate for PA, filled PPS, ABS, TPU and PC overcomes the necessity of separate operation lines when painting metallic and composite components. The ability to produce high-quality, electrically conductive thermoplastic products without compromise in terms of overall product mechanical performance or durability has already shown demand from those manufacturing fuel system parts including quick connectors, fuel pumps, valves, filter housings, EV battery caps and other car components.

Construction

Privately-owned housing starts in January were at a seasonally adjusted annual rate of 1,638,000. This is 4.1% below the revised December estimate of 1,708,000, but is 0.8% above the January 2021 rate of 1,625,000. Single-family housing starts in January were at a rate of 1,116,000; this is 5.6% below the revised December figure of 1,182,000. The January rate for units in buildings with five units or more was 510,000.

Monthly Trend of Privately Owned Housing Starts in the US, 2021-2022



Some highlights of January 2022 are as follows:

- Partnership between Dura Composites and Anderton Concrete.** Dura Composites and Anderton Concrete are teaming up to help Energy and Infrastructure customers access the best in pre-cast concrete troughs and pultruded GRP composite trench covers from a single supply chain source partner. Anderton Concrete, well known for manufacturing market-leading rail and structural precast concrete products, is now enhancing its offering of pre-cast reinforced concrete troughs to include solutions specially designed for the Power and Energy infrastructure sector. Through its partnership with Dura Composites, it will now offer a full solution of lightweight and non-conductive GRP trough lids, including molded open mesh Dura Grating for pedestrian loadings and solid pultruded Dura Slab lids for vehicular loadings. The partnership will provide UK Energy sector customers with locally available stock of concrete troughs and GRP lids alongside high levels of local technical engineering support.
- Auburn University makes Strides in Advancing Bio-Based Polymers and Fibers for 3D-Printed Home Construction.** The Auburn-led portion will focus on bio-resin development as a feedstock for 3D printing, which will be done at Idaho. This process will include conversion of biomass into chemicals and nanomaterials to help improve the sustainability of the resin. The project will also investigate the environmental impact of conventional concrete and steel used in the construction of traditional buildings, in comparison with tall timber buildings, which emit only one-third to one-half of the greenhouse gases traditional materials emit.
- Fibrolux GmbH Supplies Marshal Jozef Pilsudski Bridge with over 16km of Pultruded Deck Beams.** Fibrolux apprised of the completion of its largest civil engineering project to date. As part of an extensive bridge upgrade program to provide additional capacity and improve safety by moving cyclists away from the road carriageways, Fibrolux produced an innovative pultruded composite slab solution for the new walkways. Fibrolux will also supply a range of standard fiberglass pultruded sections that will directly fasten to the composite walkway slabs and will be used to support the rainwater drainage system for the refurbished bridge.

Wind Energy

According to the latest "Energy Infrastructure Update" report from the Federal Energy Regulatory Commission's Office of Energy Projects, the cumulative installed capacity of 53 units during January – November, 2021, was 9,683 MW as compared to 8,606 MW of 72 units during January – November, 2020. With a total installed generating capacity of 131.97 (GW), wind constituted 10.61% of the total installed generating capacity of 1,243.34 (GW) among all energy sources.

One of the highlights of January 2022 is as follows:

- **Covestro Receives First DNV Adjustment Certification for Partial Reduction Factor γ_{m1} of Wind Turbine Blades Using Aging-Resistant PU.** Covestro has now received the first adjustment certification from DNV, the wind power industry's certification organization, for the so-called partial reduction factor γ_{m1} of wind turbine blades made of aging-resistant polyurethane (PU). This factor is an important indicator of the long-term aging resistance of rotor blades and is also used to measure the long-term service performance of the blades. It is also the first time that DNV has evaluated and adjusted this factor.

Marine

The US marine industry is anticipated to experience good growth in 2022.

Some highlights of January 2022 are as follows:

- **Hexcel Selected for High-Quality, Paint-Ready Parts for Sunseeker 90 Ocean Luxury Yacht.** Yacht builder Sunseeker has chosen Hexcel's HexPly XF surface technology to produce prepreg parts with high-quality, paint-ready surfaces quickly and efficiently for its 90 Ocean luxury yacht, one of its newest models. The lightweight composite hardtop for the Sunseeker 90 Ocean yacht is manufactured from a combination of HexPly XF and Hexcel's HexPly SuperFIT semi-preg. The hardtop is lighter in weight than versions made using resin-infusion processes, and it de-molds with a pinhole-free surface that needs minimal preparation to be ready for paint. Sunseeker has recorded an overall reduction in process time of around 30%, saving three days of manufacturing time per hardtop.
- **A C Marine & Composites Supplies World's Biggest Air Cushion Barge Equipped with Carbon Fiber Propeller Ducts.** A C Marine & Composites was contracted to supply four carbon fiber propeller ducts for an air-cushion barge (ACB) by Mangistau ACV Solutions, part of the CMI Offshore group. Units engineered by Gurit Composites Engineering were built by A C Marine & Composites in Gosport, Hampshire using advanced infusion technology. The barge is built of steel and powered by three lift fans. It weighs 300 tons and operates on a cushion of air over water, ice, tundra, land or marsh, without damage to the environment. The barge has undergone a series of trials on sea and ice, and will be used for essential services on ice in the winter and in shallow waters for the rest of the year.

Consumer Goods

New orders for manufactured durable goods in January increased \$4.3 billion or 1.6% to \$277.5 billion, according to the U.S. Census Bureau. This increase, up eight of the last nine months, followed a 1.2% December increase. Excluding transportation, new orders increased 0.7%. Excluding defense, new orders increased 1.6%. Transportation equipment, up three consecutive months, led the increase, \$2.9 billion or 3.4% to \$87.6 billion.

Some highlights of January 2022 are as follows:

- **SAVA Introduces E-Flash - Lightest Carbon Fiber E-Gravel Bike for All-Terrain Riding.** SAVA, a German registered company known for innovative bicycle design, has launched their latest: SAVA E-Flash the Lightest Carbon Fiber E-Gravel Bike for all-terrain riding, daily commuting, and outdoor adventures. Highly responsive and lightweight, SAVA E-Flash is designed for comfort, stability and efficiency. Its carbon fiber construction offers extreme lightweight performance at only 11kg total weight. The carbon fiber frame & fork also make it easy to pick up and carry when needed, something that commuters can appreciate.
- **Elkhart Composites acquired by Thor Industries.** Elkhart Composites is engaged in the development and sale of a proprietary sustainable foamed polypropylene-based composite material marketed and sold under the “Elkboard” brand name. Lightweight, rigid, durable and sustainable, Elkboard is used in the RV industry for sidewalls, in lieu of traditional luan-based sidewalls, alleviating susceptibility of rot or delamination.
- **NCC Helps Starling Cycles and Composite Braiding Develop Thermoplastic Carbon Fiber Electric Bike Frame.** Working with Starling Cycles and Composite Braiding, the National Composites Centre (NCC) has proven that thermoplastic carbon fiber can be used to make an electric mountain bike frame, which means it can be repaired and recycled at end of life more easily. In addition to showing that thermoplastics are a strong enough material to be used for a bike frame, the expanded understanding of how they can be re-worked and re-used opens the door to using thermoplastics in other components across industry due to the flexibility they offer. They can also offer higher production rates (due to the lack of separate infusion process), whilst still providing the high quality of composites, potentially allowing for a reduction in costs and environmental impact.

Recent Development in Materials

- **Suprem Thermoplastic Composites Contribute to Pressure Vessel Expansion.** Suprem SA is developing high-quality, high-performance thermoplastic composite materials to support the expanding use of pressure vessels for CO2 emission reduction. The thermoplastic tape offers consistent quality and high mechanical performance, reducing the amount of material needed to manufacture high-pressure tanks, and offers opportunities for recycling and reuse after service.

Recent Product Launches in the Composites Market

The following table represents new product launch in the composites market in January 2022.

Product	Company Name	Description
BRUTALE FG (Fiberglass face) and BRUTALE CF (Carbon fiber face)	KitchenPro	KitchenPro's new patent pending design includes the first tubular carbon fiber frame with an open throat below the playing surface of the paddle, similar to the current tennis racquet design. The primary advantage of this design is to enhance the structural integrity and reliability of paddles, which are inherently weak in the neck and handle areas.
OKAI EB20	OKAI	The OKAI EB20 is four-link, soft tailed e-Bike, and the first to use a lightweight carbon fiber frame. It is fully compatible with a broad range of professional MTB components from leading manufacturers including Shimano, SunTour, Bafang, and Tekro.

The US Economic Overview – January 2022

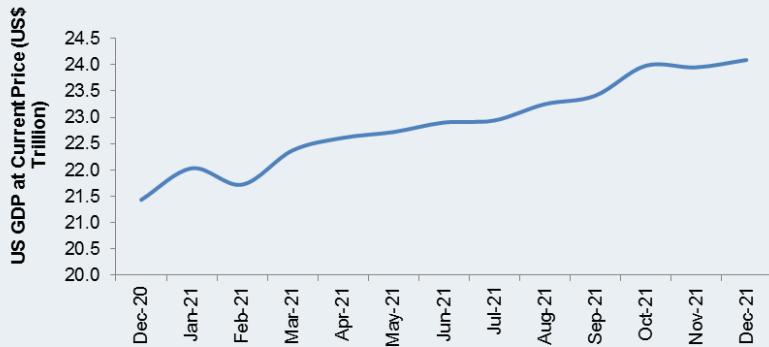
The US Consumer Confidence Index decreased to 68.8 in January 2022 as compared to 70.6 in December 2021. The GDP at current price of the US increased from US \$23.95 trillion in November 2021 to US \$24.09 trillion in December 2021.

Real gross domestic product (GDP) increased at an annual rate of 7.0% in the fourth quarter of 2021, according to the "second" estimate. The increase in real GDP primarily reflected increases in private inventory investment, exports, personal consumption expenditures (PCE), and non-residential fixed investment that were partly offset by decreases in both federal and state and local government spending.

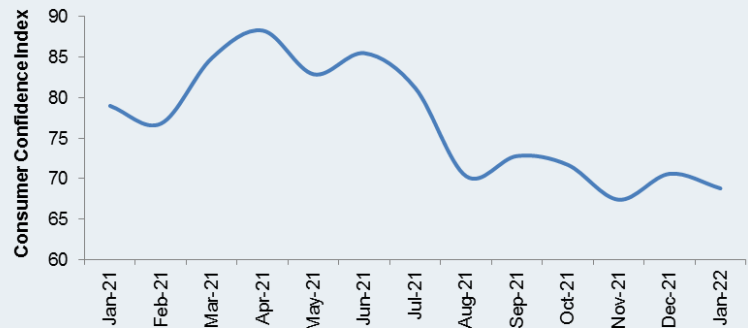
The increase in fourth quarter GDP reflected the continued economic impact of the COVID-19 pandemic. In the fourth quarter, COVID-19 cases resulted in continued restrictions and disruptions in the operations of establishments in some parts of the country. Government assistance payments in the form of forgivable loans to businesses, grants to state and local governments, and social benefits to households all decreased as provisions of several federal programs expired or tapered off.

The price index for gross domestic purchases increased 7.0% in the fourth quarter, an upward revision of 0.1% point. The PCE price index increased 6.3%, a downward revision of 0.2% point. Excluding food and energy prices, the PCE price index increased 5.0%, an upward revision of 0.1% point.

Monthly Trend of the US Current GDP in 2020-2021



Monthly Trend of Consumer Confidence Index in the US, 2021-2022



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