

Mitigating New Energy Challenges with BASF

The capacity for renewable energy increased 6% in 2021 reaching close to 295 GW, compared to 2020, where wind capacity addition dipped by 17%, offsetted by an increase in Solar and Hydropower installations. This happened amidst several demand and supply shocks stemming from the global pandemic.

The addition to renewable capacities is expected to break records in 2022 with a forecast of 8% increase, pushing through the 300 GW mark. In contrast to 2020, the global offshore wind installation is predicted to double despite China's national policy phase-out deadline, while solar PV is forecasted to break record in 2023, reaching 200 GW. At the moment, China accounts for 46% of worldwide renewable capacity addition, followed by the European Union and the United States.

Solar and wind equipment manufacturers and suppliers are navigating a supply chain predicament made worse with countless bottlenecks. Prior to the global pandemic, new energy especially solar power, was gaining traction. However, it dropped to its lowest in 2020 of up to 64% dropping to its lowest since 2010. From the first quarter of 2021, the renewable energy industry saw skyrocketing raw materials and shipping costs, equipment prices, increased import tariffs, new labor practices and other government regulations. By March 2022, the price of PV-grade polysilicon more than quadrupled, steel prices increased by 50%, copper rose by 70%, aluminium doubled and freight costs rose almost five-fold. Surging freight costs are the biggest contributor to overall price increases for onshore wind. For solar PV, the impact is more evenly divided among elevated prices for freight, polysilicon and metals.

RISING SHIPPING COSTS & REGULATORY LABOUR PRACTICES FROM CHINA

China is one of the biggest manufacturers of new energy panels. In 2021, prices of shipping containers leaving from China, such as Shanghai, have increased roughly six-fold from its pre-pandemic baseline. This radical increase in prices could be attributed to the global pandemic where substantial shipments by sea were canceled; to date, even with the global economy opening up and resuming business as usual, the shipping industry is still on a long road to recovery.

SLOWER PRODUCTION OF KEY PHOTOVOLTAIC COMPONENTS

In 2021, the photovoltaic industry saw its worst polysilicon shortage for the first time in 10 years. The popular demand for solar panels and wind turbines pre-pandemic caused manufacturers at various stages in the supply chain to enter the Bullwhip Effect. However, when the pandemic

happened, these same manufacturers slammed the brakes and slowed or ceased production. When economic activity bounced back faster and better than expected, the demand for raw materials soared, and polysilicon miners and refiners struggled to catch up, sending prices skyrocketing.

These supply chain chokeholds have a ripple effect—as many market watchers would already know—and have exposed engineering, procurement and construction (EPC) industries, and developer firms to risks that threaten the success in commercial, industrial, and utility photovoltaic (PV) projects. Further compounding this is the pressure from federal legislators, who are adamant on implementing a “Green” Economic Overhaul as quickly as they can—it has almost become akin to a race of “who has the most green energy production”.

NAVIGATING THE SUPPLY CHAIN BOTTLENECK WITH BASF

Will supply chain woes hamper the expansion of the photovoltaic and green industry? The simple answer is “no”, and the complex answer is “it will”. If organizations play their cards right, they would be able to meet the demands quickly with the collaborative support of companies like BASF who develops a suite of photovoltaic new material solutions to enable businesses.

With the current supply disruptions, and even keeping in mind the possibility of further challenges in the future, BASF sees the importance of creating solutions that are more sustainable, and address the need for energy efficiency and conservation. With their knowledge and expertise in chemistry for oilfields, refineries, mining, wind and solar energy, they partner with and enable customers through a commitment to a healthier, more natural and more affordable future for energy and resources.

As the world's leading chemical company, BASF covers the entire production process for the photovoltaic industry— solar cells and panels, and even the components for the wind turbines; from cutting the silicon ingots to metallization to frame fabrication. The BASF Creation Centers are anchored with sustainability in their language. Offering a broad selection of material competencies ranging from Polyamide (PA), Polyethylene-phthalate (PBT), Polyoxymethylene (POM), Thermoplastic Polyurethane (TPU) and even Polyurethane Systems, BASF prides itself on developing high performance products that are durable and improves efficiency.

With sustainability at the core of their developments, BASF's integrated end-to-end PV Solar Solutions further amplifies a country's go-green initiatives for a brighter and green future. There are a wide variety of applications available such as Ultramid® FR (PA) for connectors and junction boxes or using Ultramid® (PA) and Ultradur® (PBT) for PV module, or even using Elastollan® (TPU) for cables and wires; the applications and possibilities ahead are endless.

Connectors and Junction Boxes using BASF's Ultramid® FR (PA)

- Good chemical resistance
- Good processability
- Good hydrolysis resistance towards heat and humidity

- Fits to all standards and regulations (e.g., TUV, VDE, IEC, UL)
- Ease of use
- Measurable product performance

PV Module using BASF's Ultramid® (PA) and Ultradur® (PBT)

- Reduces weight
- Resistance to corrosion
- Resistance to environmental factors such as humidity, ozone damage and microbes
- Very good flexural fatigue strength
- Easy assembly and installation
- Efficient to produce in large amounts

PV Module using BASF's PU Solution

- Design freedom
- Resistant to corrosion
- Good environmental resistance
- Good mechanical stability
- Good chemical resistance
- Low thermal expansion
- Easy to assemble and install
- CAE simulation
- Optimized design structure

Cables and Wires with BASF's Elastollan® (TPU)

- Excellent low temperature resistance and flexibility
- Good life span for wear and tear
- Good environmental resistance
- Excellent flexural fatigue strength
- Good color stability
- Abrasion resistance

Partnering with BASF ensures that there will be an end-to-end experience for companies in the photovoltaic industry since it develops its components at its own factories and laboratories. From the upstream process (manufacturing) to the downstream process (energy management), BASF's innovative and sustainable products cover most of the target applications.

Source: [Renewable electricity – Renewable Energy Market Update - May 2022 – Analysis - IEA](#)