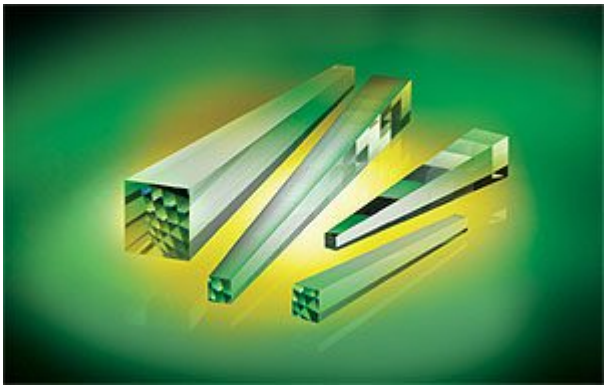
Green Photonics

Lasers are not all that's green in the photonics industry. Photonics technologies are helping to reduce energy consumption, they're used in the manufacturing of renewable energy technologies, and many green, sustainable practices are adhered to throughout the photonics industry. And, yes, trend that it is – there is certainly green in going green. New technologies and products are developed with energy efficiency in mind. This is not only because energy savings is a buzz word or marketing tool but also because customers are trying to cut their manufacturing costs – and saving electricity is a great way to start. As an example, Power Technology (PTI) of Little Rock, Ark., has replaced inefficient gas lasers with diode lasers. The IQ Micro (IQu) laser at 488 nm produces 60 mW of light and typically requires less than 10 W of energy to operate. The argon gas laser it replaces required 1500 W to generate the same power and wavelength.



Imaging in Green Apps

Use of machine vision systems in the solar industry makes sense, as precision and high-quality output are of paramount importance. According to Gregory Hollows, director of machine vision solutions at Edmund Optics in Barrington, N.J., machine vision used in the solar industry is not just about looking for defects in wafers. "A subtle modification of one lens can be like reinventing the wheel," Hollows said. The goal is to see with the camera what you see with the eye. It has to be

done on the assembly line, and it has to be repeatable over and over. In some cases the material itself presents challenges – from highly reflective to curved to flat – "many properties come into play."

Optics in Solar

The huge growth in solar energy installations has presented optics manufacturers with new opportunities for components that collect or focus the sun's energy. Some of the components are similar to those made for other applications, such as homogenizing rods, light pipes or lightguides, according to Gregg Fales, product line manager at Edmund Optics. In some cases, solutions are customized for specific photovoltaic applications. For example, concentrated photovoltaics (CPV) requires a square aperture at one end of a concentrated parabolic concentrator (CPC) that's bigger than the square aperture at the other end.

Solid-State Lighting

Optics engineers and other lighting experts are hard at work trying to improve solid-state lighting, driven in part by government mandates. According to a report by the US Department of Energy, 22 percent of the electricity generated in the US goes toward lighting applications. If light sources were converted to more energy-efficient LEDs, electrical use would be significantly reduced. To that end, governments are promoting research and development in the area of LEDs so that the technology can catch up with the demand for lighting applications. The US Department of Energy, for example, set a research goal of 160 lumens per watt by 2025.

Adhering to Green

Companies are also embracing sustainability efforts such as "lean" manufacturing, adoption of the Waste Electrical and Electronic Equipment (WEEE) initiative, compliance with RoHS standards and the REACH initiative. And many are taking a

myriad of smaller measures that add up to a great amount of energy saved, such as recycling manufacturing byproducts, installing energy-efficient lighting and more.

For more information: https://www.photonics.com/Articles/Green_Photonics_/a41461