

STANLEY
Engineered Fastening



**How To Choose The Right Fastening Solution
For Your Renewable Energy Project**
Quick Guide

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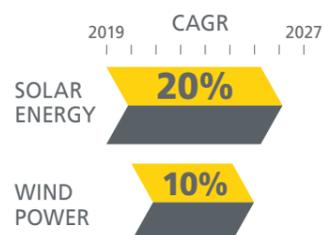
Currently, global energy initiatives are driving rapid growth in renewables: in the next five years, the CAGR for the solar market is forecast at 20%, and wind is just over 10%. As this sector expands, leaders in renewable energy manufacturing need to understand different assembly solutions so they can choose the right one for each application.

Renewable energy projects face specific challenges, including constant vibration, corrosion, extreme weather conditions, high temperatures, and material fatigue. When choosing the right fastener, manufacturers should focus on solutions that are both reliable and long-lasting. For renewable energy infrastructure, another important consideration is power tool selection, focusing on factors from mobility to torque control. The wrong fastener or installation procedure can dramatically increase costs.

This Quick Guide explores three steps to follow for choosing the right fastening solution for your application.



GROWTH PROJECTIONS BY INDUSTRY



Step 1 - Understanding Your Application

Solar

Each of the two primary solar applications (photovoltaic tracking and concentrating solar power) present specific challenges.

Photovoltaic (PV) Tracking Systems

Photovoltaic (PV) Tracking Systems are solar panel modules that follow the sun throughout the day, tilting at a sharp angle to maximize solar radiation consumption and therefore, electricity production.

The fasteners used to install these systems must be permanent, highly corrosive resistant and capable of withstanding high vibration in extreme weather events. PV systems require UL certification, and feature several different elements that need to be securely fastened.



The STANLEY Solution

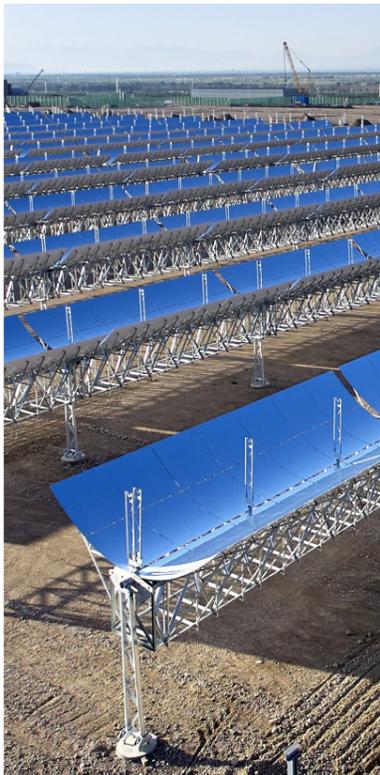
- Neobolt®, Avinox®, XT, and Avibulb XT® fasteners can be used for panel to cross bar assembly.
- Monobolt® and Avbolt® fasteners can be used for torque tube assembly.
- The Avbolt® lockbolt is suitable for joining cross bars to torque tube assembly.
- Neobolt is the most efficient solution for module attachment installation.

Solar (cont.)

Concentrated Solar Power (CSP)

Concentrated Solar Power (CSP) systems are fixed-in-place.

Specific CSP applications require special attention to the assembly process, such as the assembly of cross bars and collector bars, and the collector to collector assembly.



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- Monobolt® and Neobolt® fasteners can be used in the assembly of cross bars and collector bars.
- Neobolt® and Avdelok® fasteners can be used to connect the collector to the collector assembly.

Wind

Wind energy systems include different components, each presenting a completely unique set of circumstances and requirements.

While wind turbines are heavy, massive and subjected to continuous vibration, the wind towers supporting them require permanent large-diameter fixations that are long-lasting and reliable. Another part of a wind energy system is the engine housing, which requires permanent fixation with high reliability and little maintenance.



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- Wind turbines are heavy, massive, and are subjected to continuous vibration, making threaded special fasteners such as Spirallock® and Ferry Cap solutions optimal choices for withstanding fatigue and vibration stress.
- Engine housing requires permanent fixation that can be installed on-site with cordless tools, with Neobolt® solutions at the top of the list of suitable fasteners.
- Wind towers are enormous structures held together with permanent large-diameter fasteners that should require little to no maintenance. For this application, Neobolt®, Avdelok®, and Spirallock® bolts work well, but Nelson stud welding solutions are also ideal: stud welds work with large diameter fastenings, can be installed quickly, and are long-lasting and reliable.

Solar and wind installations have logistical challenges in common: in most cases, the fastening is done in remote locations with no access to power sources. This makes choosing the tool to install these fastening solutions critically important, with battery-powered tools presenting a more convenient solution compared to pneumatic tools.

Step 2 - Understanding Which Type of Fastening System Solution Best Fits Your Renewable Application

The three types of fastening systems best suited for renewable energy projects are specialized nuts and bolts, rivets, and stud welding. Each of these fastening solutions is uniquely suited to different, specific renewable applications.

Threaded, Nut and Bolt fasteners such as Spirallock® are useful in applications where vibration resistance is critical but adjustments are required. Spirallock® is specifically designed for extreme temperatures, heavy shock and vibration, long hours of strenuous operation, and millions of loading cycles—the exact challenges facing wind generation facilities. Because they are reusable, these fasteners allow rapid repair turnarounds.

Blind rivet fasteners are a perfect fit for the solar energy sector, with high strength breakstem systems such as Monobolt® and Avbolt® offering high-speed fastening solutions for applications where there is only one-sided access.

Lock Bolts such as NeoBolt® system and Avdelok® fasteners are popular in wind and solar applications. They feature annular locking grooves that resist vibration and fatigue—preventing unscrewing or becoming loose. Solar customers have reported saving almost 25% in hand labor-related cost using NeoBolt® fasteners in lieu of its threaded counterparts.

Stud Welding for construction of wind turbine towers, NELSON® stud welding offers one of the most reliable, easily-installed fastening systems for foundation elements that need to have strong adhesion with concrete parts.



Step 3 - Finding a Supplier with Proven Experience and Global Manufacturing Presence that Offers Local Support

Once you've narrowed down your fastening solution to the one that best fits your project needs, you need to select a supplier to source your fasteners from. Most of the big players in the renewable sector partner with suppliers who have proven experience and global manufacturing capabilities. Beyond that, the most reliable suppliers are able to act locally and quickly to support customers.

Consider that in a large solar installation there may be upwards of a million fasteners needed to complete the job. Even a minor supply chain issue can cost an installer significant amounts of time and money through delays and missed deadlines.

STANLEY Engineered Fastening has been growing alongside the renewable sector for decades, developing specialized solutions specifically for wind and solar energy systems. With the broadest portfolio of fastening solutions in the industry, we can help recommend the best solution for your application. Our global presence and customer support network ensure that customers are never left on their own.

Contact a representative today to find the right fastening solution for your renewable project.

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STANLEY ENGINEERED FASTENING FAMILY OF BRANDS

AVDEL INTEGRA NELSON OPTIA POP STANLEY Assembly Technologies TUCKER