5 BEST PRACTICES FOR C&I SOLAR EPCS & DEVELOPERS:

Important Lessons From Trina Solar's C&I Solutions Team

Trinasolar

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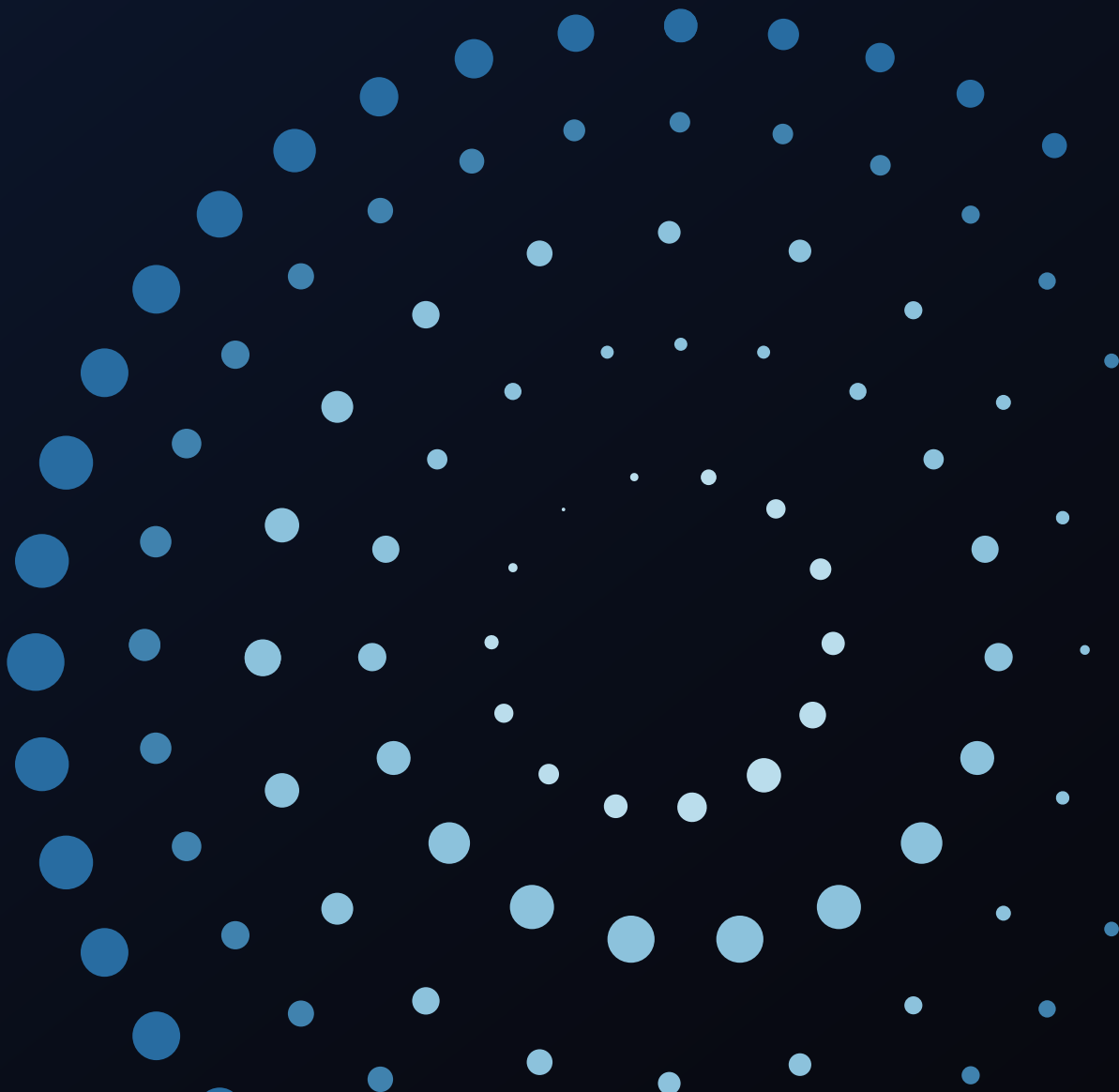


INTRO

After steady expansion for years, commercial and industrial (C&I) solar is poised for major growth. Many factors are contributing to this growth, including declining levelized cost of electricity (LCOE), increased awareness of solar's benefits and new, innovative C&I solar solution offerings.

C&I demand for renewable electricity has been an important accelerant to the recent growth in renewable energy, with nearly 25 gigawatts (GW) of renewable energy contracted by C&I operations between 2010 and 2019.

More than 200 companies have committed to 100 percent renewable energy supply, according to RE100, the global corporate renewable energy initiative bringing together hundreds of large businesses. In addition, nearly 1,000 companies have committed to science-based targets to climate action. With these growing market signals, solar engineering, procurement and construction (EPCs) and project developers need to be more efficient than ever to take strategic advantage of these opportunities.

In this ebook, we identified the top five best practices to help C&I solar EPCs and developers optimize system design, maximize energy production and, ultimately, grow their businesses.

[1] *REBA Institute, Renewable Energy Policy Pathways Report, https://reba-institute.org/research/*
[2] *RE100, http://www.there100.org/companies*

STREAMLINE COMPONENT **PROCUREMENT**

In the past, procuring high quality solar components required EPCs and developers to juggle multiple distributors. In many instances, many smaller EPCs and developers weren't operating at the scale necessary to partner with larger distributors or build direct relationships with original equipment manufacturers (OEM).

These obstacles would create a patchwork procurement process that can all too easily lead to scheduling nightmares and logistical headaches.

As the solar industry continues to mature, innovative new options have become available. Now, even smaller EPCs and developers can access industry-leading solar components directly from OEM sources. This greatly streamlines the procurement phase, ensuring timely delivery and component interoperability.

Additionally, by partnering with the right solar OEM, EPCs and developers can incorporate more products and services to their core offerings, which help improve system performance and energy yield. These products and services include:

- Inverters (1000V & 1500V options)
- Rapid shutdown devices (2017 NEC compliance)
- Versatile racking equipment (rooftop, ground mount, canopy - fixed-tilt, single-axis trackers)
- O&M services
- Dedicated service representatives

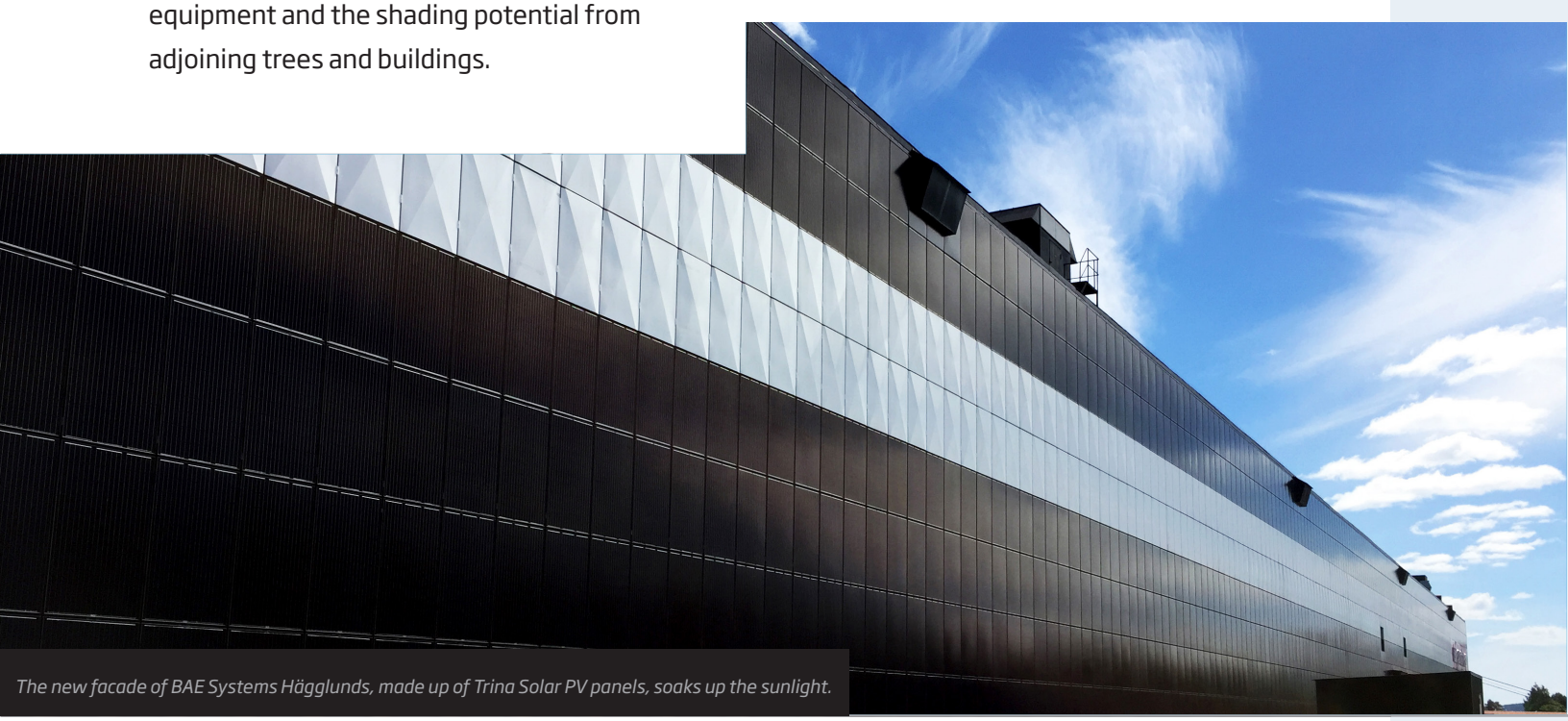
With a greater array of easier-to-access options for customers, EPCs and developers can attract new customers and expand their market presence in the highly competitive but fast-growth C&I solar segment.

MAXIMIZE AVAILABLE SPACE

Many businesses are perfectly designed for a PV system, whether due to large property size or expansive, flat roofs. However, no two commercial solar projects have the same layout or plot dimensions, which means each project will differ greatly in its needs and design. Rooftops vary greatly from one building to the next. Additionally, layout designs will also have to account for the placement of HVAC equipment and the shading potential from adjoining trees and buildings.

Further, there's no nationwide standardization, as states and local jurisdictions each have their own regulations, permits and markets.

This means, EPCs and developers will essentially need to start from scratch on every commercial solar project design. This presents a challenge to ensuring the available space is used as efficiently as possible.



The new facade of BAE Systems Hägglunds, made up of Trina Solar PV panels, soaks up the sunlight.

The right mix of modules, inverters and racking can optimize the available space for any project. For instance, the strategic placement of string inverters on a rooftop system can allow for a greater number of solar modules. Meanwhile, ground-mounted PV systems can leverage solar fixed tilt ground mount racking or single-axis trackers to boost energy harvests. Bifacial modules coupled with bifacially optimized racking systems are a recent industry trend gaining traction too.

A recent study found that the combination of bifacial modules and trackers can produce nearly 35 percent more energy while reducing the levelized cost of electricity (LCOE) by an average of 16 percent.

[3] *"Global Techno-Economic Performance of Bifacial and Tracking Photovoltaic Systems," Rodriguez-Gallegos et al., Joule volume 4, issue 7, pgs. 1514–1541. https://www.cell.com/joule/fulltext/S2542-4351(20)30188-4*

OPTIMIZE INTEGRATION **AND INTERCONNECTION**

Scheduling conflicts and interoperability issues can be the bane of a solar PV project developer or EPC. Nothing slows down system integration and grid interconnection faster than discovering two components don't work together after a delayed delivery to the jobsite. This can only compound the challenges presented by the complexity of some federal and state requirements, technical regulations and the varying timelines of stakeholders.

Properly optimizing integration and interconnection can:

improve the PV system economics, and

reduce operational costs and provide additional value to the consumer.

Working with a single, one-stop shop C&I solution partner helps EPCs and developers ensure a seamless integration and interconnection process. These partners can often provide the technical expertise to efficiently integrate all components, including PV modules, inverters, racking and storage. Further, this will better accommodate a wide range of system sizes, designs and applications.

4

UNDERSTAND **FINANCING OPTIONS**

With so much potential in the C&I solar sector, many institutional investors, capital partners and other project financiers see the promising possibility of C&I growing as a valuable asset class. A roundtable of market participants convened by Power Finance & Risk discussed the likelihood for C&I solar in the realm of asset-backed securities in the near future as well.

Given the complexity and variables involved in cost optimal financing, EPCs and developers need to familiarize themselves with the available options and find the one that best suits their project needs.

A few popular options available include:

Power Purchase Agreements (PPAs)

With this option, the C&I customer agrees to purchase the power produced by the PV system from the owner at a certain price for a set number of years, typically between 10 and 25.

Solar Leases

Similar to PPAs, solar leases allow C&I operations to lease the PV system from a third-party company, in exchange for receiving the benefits of the system.

Energy Service Agreements (ESAs)

ESAs work as an off-balance sheet financing option wherein a service provider delivers energy-saving services through equipment ownership and operations.

C-PACE

Allows a property owner to finance the up-front cost of energy or other eligible improvements on a property and then pay the costs back over time through a voluntary assessment. The unique characteristic of PACE assessments is that the assessment is attached to the property rather than an individual.

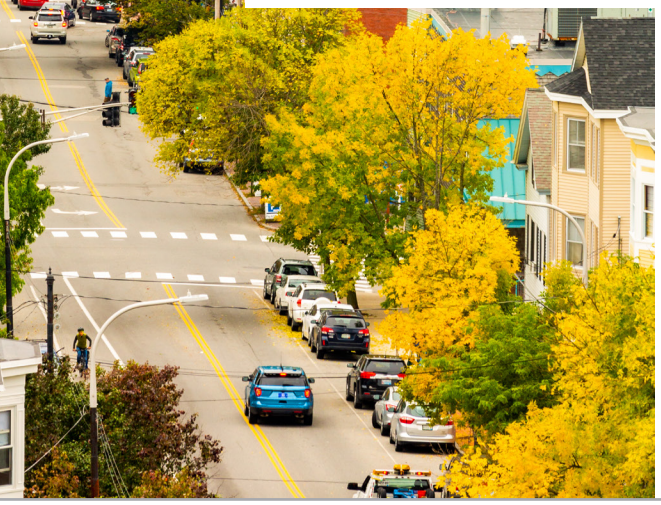
[4] *Power Finance Risk Solar ABS Roundtable 2019/20*
http://www.powerfinancerisk.com/Article/3915846/Default/PFR-Solar-ABS-Roundtable-201920.html

GROW THROUGH **STRATEGIC PARTNERSHIPS**

Although solar energy fosters energy independence, building and maintaining strategic partnerships is invaluable in the industry. With the right partnerships, EPCs and developers can provide more benefits to their end-customers and potentially increase revenue on C&I solar projects.

One such type of partnership includes solar programs or solar campaigns. This partnership may be with a corporation, university, non-profit or an entire town. These programs and campaigns serve as a means to educate consumers and organizations about the benefits of solar in local areas. They also provide a way to gauge the local market's interests and ideas on solar, as this varies from one community to the next.

For examples of solar campaigns, EnergySage provides a resource for listing, finding and partnering with a wide range of solar campaigns, each with their own



Another type of partnership involves using innovative all-in-one C&I solar solutions. This type of arrangement makes it easier for small-to-mid-sized EPCs and developers to gain access to industry-leading solar components, streamlined installations and unparalleled service.

5 BEST PRACTICES FOR OPTIMIZING SOLAR C&I PROJECTS

1 Streamline Component Procurement

Consider working directly with the solar OEM to reduce scheduling conflicts and interoperability issues.

2 Maximize Available Space

The right mix of modules, inverters and racking can greatly increase energy production.

3 Optimize Integration and Interconnection

Working with a one-stop shop C&I solution partner helps EPCs and developers ensure a seamless integration and interconnection process.

4 Understand Financing Options

From PPAs to ESAs, it's important to find the financing option that best suits a project's needs.

5 Grow Through Strategic Partnerships

Look into local solar campaigns and solar C&I solutions to help increase community awareness and gain additional benefits.

CONCLUSION

Implementing these best practices requires strategic planning and careful execution. Thankfully, the professionals on the Trina Solar's C&I Solutions team make it easy.

EPCs and developers that partner with Trina Solar's C&I Solutions gain access to dependable on-time delivery of Tier 1 PV components from one of the solar industry's most bankable companies. With one-stop shopping for procurement, dedicated service representatives, seasoned technicians to assist with integration and logistics experts to ensure on-time delivery of the components, EPCs and developers can easily implement the best practices outlined in this ebook.

Want to know more about the benefits and added value Trina Solar's C&I Solutions provide?

Contact us today to learn more about how streamlined procurement, optimized integration and dedicated service representatives can help EPCs and developers to grow their businesses.