July 25, 2023

The Honorable Janet L. Yellen
Secretary
Department of the Treasury
1500 Pennsylvania Ave, NW
Washington, D.C. 20220

The Honorable Danny Werfel,
Commissioner
Internal Revenue Service
1111 Constitution Ave, NW
Washington, D.C. 20224

Members of the United States Senate
and U.S. House of Representatives

Dear Secretary Yellen, Commissioner Werfel, and Members of Congress,

As leaders representing America's domestic steel producers and the millions of American workers that are employed as a result of our industry, we write today regarding serious concerns with the recent Domestic Content Bonus Credit Guidance ("Guidance") published by the Department of the Treasury and the Internal Revenue Service (IRS) describing rules for implementing the domestic content bonus credit requirements for solar and other renewable energy electricity generation projects under the Inflation Reduction Act (IRA).[1]

As such, we are requesting the immediate correction of an error in the Guidance that places the structural steel components of photovoltaic trackers in the Manufactured Product category instead of the Steel and Iron category.

If the current Guidance were to be made final, it would significantly damage U.S. domestic steel producers, putting at risk 1.5 million tons of production and jeopardizing the livelihoods of millions of Americans who depend on our industry. It also puts at risk the hundreds of millions of dollars that companies are investing to support domestic solar production. Additionally, if left unaddressed, it would severely undermine a key goal of the IRA: to require the structural steel components of new solar projects eligible for the domestic content bonus credit requirements to be manufactured with steel and iron that are produced entirely in the United States.

[1] Notice 2023-38, Domestic Content Bonus Credit Guidance under Sections 45, 45Y, 48, and 48E, May 12, 2023.

Specifically, in the "safe harbor" provisions of Section 3.04 of the Guidance which identify project components that would be categorized as "steel and iron" and "manufactured products" for a utility-scale photovoltaic system, the Guidance incorrectly categorizes "photovoltaic tracker" as a manufactured product. A photovoltaic tracker is a mounting structure that has the capability to follow, or "track", the position of the sun.

As you know, the Treasury Department consulted with the Department of Energy in preparing the Guidance. The Department of Energy's supply chain report on solar photovoltaics in response to Executive Order 14017 clearly outlines the structural nature of tracking systems:

> "PV mounting structures hold PV panels in place, securing them from wind, and ideally providing air circulation underneath to keep them cool (allowing the cells to operate more efficiently). A significant portion of mounting structures is made of galvanized or stainless steel."[2]

Mounting structures are where the steel and iron in a solar project are concentrated. According to the Department of Energy report, "[t]here are four primary mounting structures deployed in the United States: single-axis tracking ground-mount systems, fixed-tilt ground-mount systems, penetrating rooftop systems, and ballasted rooftop systems."

Thus, tracking systems are a form of mounting structure, on a par with fixed-tilt systems. The steel structural components of tracking systems, i.e., torque tubes, foundations, and rails, therefore, must be included in the "steel and iron" category," as they are in fixed-tilt ground-mount systems. Torque tubes, while not appearing in fixed-tilt systems, are structural in nature, in that they bear the load of the solar panels, to which they are attached via rails and purlins. The fact that they rotate does not change their structural nature, which is demonstrated clearly in the attached Appendix.[3] The non-structural components of tracking systems, including bearings, drive train components, and shock absorbers, are properly categorized as manufactured products.[4]

Failing to recognize the structural nature of tracking systems has grave implications: to include tracking systems in the manufactured products category has the effect of removing much of the steel and iron used in the mounting structure from the "steel and iron" category, where it would be required to be of U.S. origin. Categorization of tracking systems as manufactured products would permit many of the structural steel components of new solar projects in the U.S. to be imported from China and other countries desiring to target the U.S. market and U.S. jobs by dumping their excess steel capacity in the U.S., so long as the overall project met the 40 percent domestic content requirement.

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[2] See Appendix A: Solar Photovoltaics – Supply Chain Deep Dive Assessment, U.S. Department of Energy Response to Executive Order 14017, "America's Supply Chains," February 24, 2022.

[3] See Appendix B: Photographs of photovoltaic trackers.

[4] Neither can an entire tracking system be characterized as a "manufactured product" – the assembly of the system's various components on site does not qualify as a "manufacturing process" as defined in the Guidance.

To avoid this result, we ask that the safe harbor table in the Guidance be immediately amended to distinguish between the structural steel components and the other components of tracking systems, by including in the Steel/Iron category, and excluding from the Manufactured Product category, "steel or iron in module rails, support columns, torque tubes, and any other elements that are structural in function," as indicated in the attached Appendix.[5] This correction is consistent with the Guidance, which states, "The Steel or Iron Requirement applies to Applicable Project Components that are construction materials made primarily of steel or iron and are structural in function."

Fixing this error in the Guidance is consistent with the clear intent of Congress that the steel and iron in solar electricity generation projects be produced entirely in the United States. Additionally, it ensures that the Guidance does not unwittingly benefit China and other countries that have a history of using predatory, illegal trade tactics to target the U.S. steel industry.

The IRA is a historic piece of legislation and we applaud the domestic investment that it has already spurred. The domestic steel industry is prepared and ready to serve the U.S. solar energy market. Our industry and its workers want to be part of the nation's economic expansion in the renewable energy sector. As such, we strongly urge the Biden administration to correct the error in the Guidance that threatens to undermine the IRA's intent and the viability of a substantial sector of the U.S. domestic steel industry.

Thank you for your attention to this urgent matter.

Sincerely,

Zekelman Industries
Nucor Corporation
U.S. Steel
Steel Dynamics, Inc.
North Star BlueScope Steel
United Steelworkers
Committee on Pipe and Tube Imports (CPTI)
Coalition for a Prosperous America

cc: Honorable Jennifer Granholm, Secretary, U.S. Department of Energy
Ali Zaidi Assistant to the President and National Climate Advisor to lead the Climate Policy Office.

[5] See Appendix C: Table 2 – Categorization of Applicable Project Components. Notice 2023-38, Domestic Content Bonus Credit Guidance under Sections 45, 45Y, 48, and 48E, May 12, 2023.

APPENDIX A

U.S. DEPARTMENT OF ENERGY

Solar Photovoltaics

Supply Chain Deep Dive Assessment

U.S. Department of Energy Response to Executive Order 14017, "America's Supply Chains"

February 24, 2022

About the Supply Chain Review for the Energy Sector Industrial Base

This is one of a series of reports and deep dive assessments produced in response to Executive Order 14017 "America's Supply Chains," which directs the Secretary of Energy to submit a report on supply chains for the energy sector industrial base. The Executive Order is helping the federal government to build more secure and diverse U.S. supply chains, including energy supply chains.

To combat the climate crisis and avoid the most severe impacts of climate change, the U.S. is committed to achieving a 50 to 52 percent reduction from 2005 levels in economy-wide net greenhouse gas pollution by 2030, creating a carbon pollution-free power sector by 2035, and achieving net zero emissions economy-wide by no later than 2050. The U.S. Department of Energy (DOE) recognizes that a secure, resilient supply chain will be critical in harnessing emissions outcomes and capturing the economic opportunity inherent in the energy sector transition. Potential vulnerabilities and risks to the energy sector industrial base must be addressed throughout every stage of this transition.

The DOE energy supply chain strategy report summarizes the key elements of the energy supply chain as well as the strategies the U.S. government is starting to employ to address them. Additionally, it describes recommendations for Congressional action. DOE has identified technologies and crosscutting topics for analysis in the one-year time frame set by the Executive Order. Along with a policy strategy report, DOE is releasing 11 deep dive assessment documents, including this one, covering the following technology sectors:

- carbon capture materials,
- electric grid including transformers and high voltage direct current (HVDC),
- energy storage,
- fuel cells and electrolyzers,
- hydropower including pumped storage hydropower (PSH),
- neodymium magnets,
- nuclear energy,
- platinum group metals and other catalysts,
- semiconductors,
- solar photovoltaics (PV), and
- wind

DOE is also releasing two deep dive assessments on the following crosscutting topics:

- commercialization and competitiveness, and
- cybersecurity and digital components.

In addition to the solar energy-related policy strategies laid out in DOE's companion energy supply chain policy strategy report, this deep dive assessment includes its own section focused on policy strategies and recommendations.

More information can be found at www.energy.gov/policy/supplychains.

Despite the increase in capacity and subsequent increase in PV modules produced in the United States, these facilities continue to operate with significant excess capacity (Figure 52). In the past three years of the Section 201 tariff, module production and PV cell imports have been around the same level as the 2.5 GW_{dc} PV cell tariff exemption.

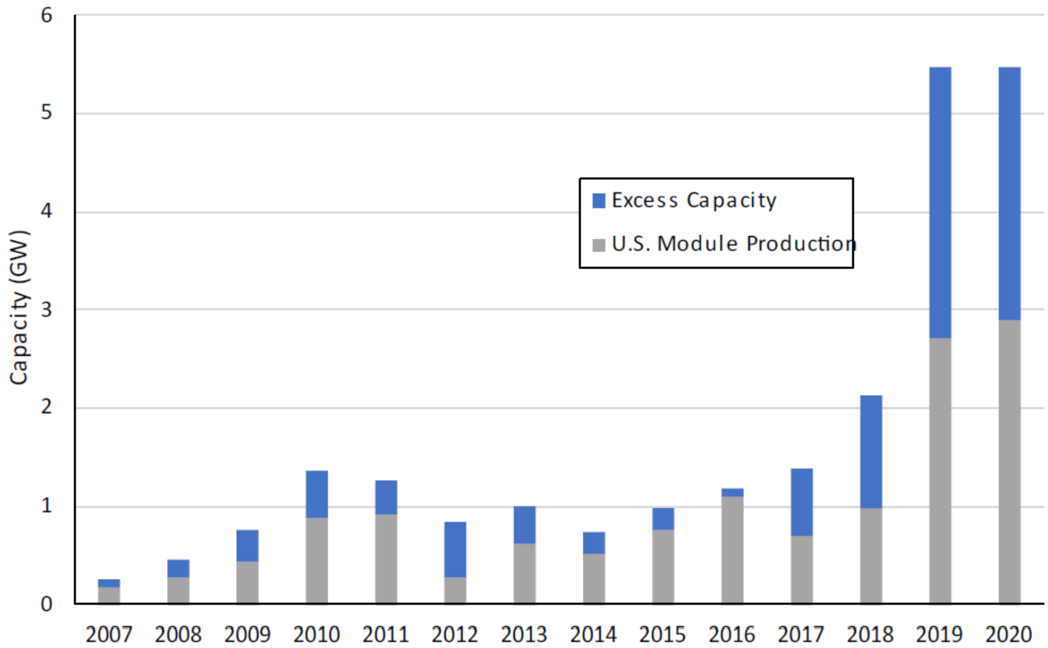

Figure 52. U.S. module production and excess production capacity.

Sources: (Wood Mackenzie Power & Renewables 2018; Wood Mackenzie & SEIA 2021)

2.6 Mounting Structures

2.6.1 Technology Overview

PV mounting structures hold PV panels in place, securing them from wind, and ideally providing air circulation underneath to keep them cool (allowing the cells to operate more efficiently). A significant portion of mounting structures is made of galvanized or stainless steel, which is composed of iron, with small amounts of carbon, manganese, silicon, phosphorus, sulfur, and oxygen. In addition to steel, aluminum is used, as well as the raw materials in electrical components, such as silicon, copper, and petroleum-based material. Other parts are manufactured using galvanized or stainless steel, but also some aluminum, electrical equipment, motors, and possibly concrete. Most of the labor spent installing PV systems, particularly utility-scale PV, involves assembling the mounting structure.

There are four primary mounting structures deployed in the United States: single-axis tracking ground-mount systems, fixed-tilt ground-mount systems, penetrating rooftop systems, and ballasted rooftop systems. Single-axis tracking systems attach the modules to a horizontal torque tube that is oriented on a north-south axis that rotates the modules from east-facing in the morning to west-facing in the evening. Fixed-tilt systems typically orient the modules facing towards the south tilted at an angle above horizontal equal to the local latitude. Rooftop systems for flat roofs typically orient the modules between southwest and southeast at a tilt angle of 10 to 20 degrees above horizontal. Rooftop systems for pitched roofs are typically coplanar with the roof. Each of the four systems will be discussed in turn.

PV trackers are used to orient modules more directly toward the sunlight to increase energy production per module. Because trackers represent moving machinery - requiring more material than fixed-tilt racking systems, as well as more land-use and higher operation and maintenance (O&M) costs - they typically represent a cost premium, but this premium is often outweighed by the increase in energy production. Single-axis trackers used to be primarily located in sunny areas, where the performance premium was more substantial. However, since 2013, with the decline in cost premium, single-axis trackers have been increasingly deployed in less sunny locations. Exceptions to this trend tend to involve specific site factors, such as being in hurricane-prone areas, greenfield sites where significant ground penetration is problematic, or on military bases (Bolinger, Seel, and Robson 2019).

Single axis tracker architecture is typically either centralized, with equipment designed to move multiple rows of PV modules at a time (typically 15 to 30), or decentralized, with equipment designed to move one row of modules at a time (Figure 53). Approximately 42% of 2020 tracker shipments used centralized trackers, while 58% used decentralized architecture (Wood Mackenzie Power & Renewables 2021a).

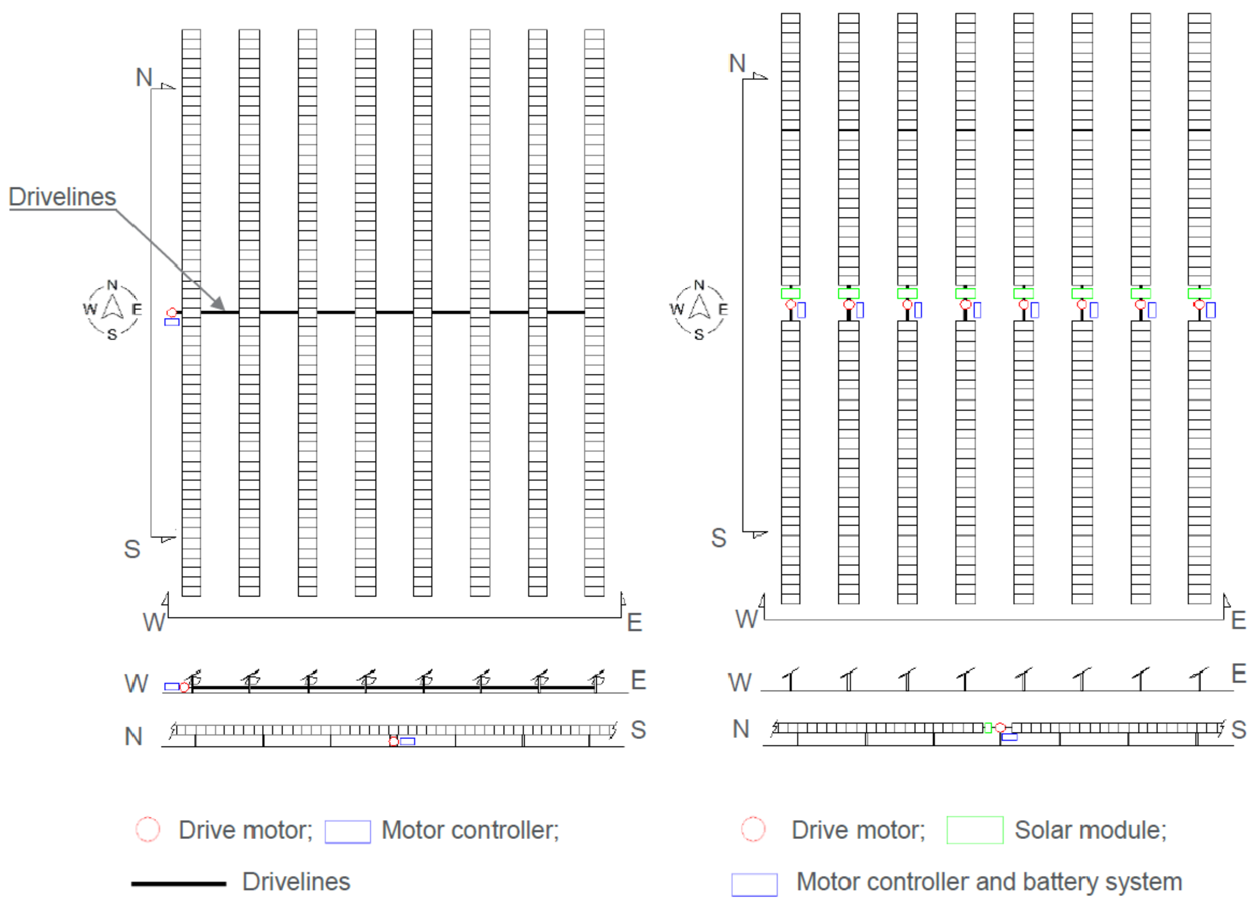

Figure 53. Multi-row (left) and single-row (right) tracking systems.

Source: (RINA Tech and Array Technologies 2020)

Five categories typically make up the components of a single-axis tracking system (Table 4). While the component categorization is similar regardless of tracker design, decentralized and centralized configurations will have different proportions of costs per category. There are over 500 major components per MW_{dc}, with thousands of minor components (e.g., nuts, bolts).

Table 4. Components of a tracking system.

Component	Description	Quantity per MW_{dc}
Structures	Typically made of galvanized steel and some aluminum	
Fasteners	*Galvanized or stainless-steel parts connecting components together (e.g., nuts, bolts)*	
Module rails	*Steel rails connecting PV modules to tracker*	
Foundations	Connects mounting structure to ground	
Support columns (driven piers)	*Steel foundational tracker support, driven into ground with machines*	*12*
Some sites also use concrete or ground screws (also made of galvanized steel)		
Torque Tube and Bearings	Determines the motion of the equipment	
Torque Tube	*A galvanized steel tube, connected to the rails holding the modules. It is rotated by a motor, so the PV panels rotate.*	*1*
Bearings	*Connect torque tube to support columns*	*376*
Drive Train (transmission system)	*Gearbox, gear racks, worm gear, and connecting rods, driveline joints, or slew drive on or near pier that allows torque tube to rotate.*	*34*
Harmonic Dampers	*Shock absorbers*	*68*
Drive Motor	Powers the movement of the rows	1 (centralized) 34(decentralized)
Tracker Control Panel, Power Supply, and Stowing	*Electronics required to perform tracking algorithm, including weather reading, sensors, and communications. Electronics and control also necessary to safety stow trackers in cases of high wind*	

Sources: (RINA Tech and Array Technologies 2020; NREL 2021)

While some preassembly of tracker components does occur, it is weighed against the additional costs of shipping a bigger piece of equipment to the PV project. A significant portion of tracker assembly occurs at the PV installation site. Tracking companies do not do the installation themselves, but rather provide training and field services to engineering, procurement, and construction (EPC) installers, particularly those whose companies have not installed that particular design, or from that particular tracker company.

The cost contribution by component will also vary depending on tracker architecture, as demonstrated in Figure 54. Centralized tracker configurations tend to have higher torque tube and bearing costs due to the need to move multiple rows with one motor, but they save on fewer pieces of redundant electronic equipment.

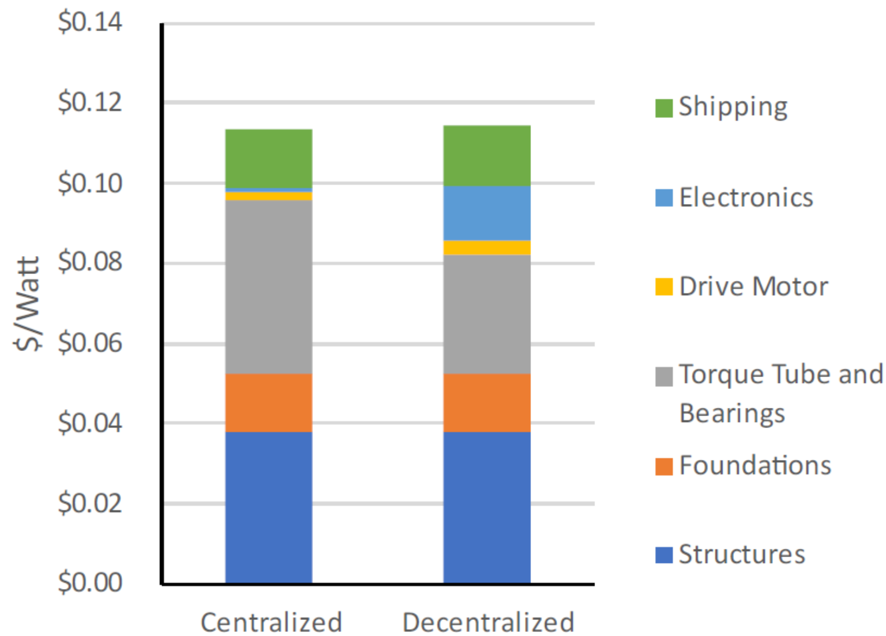

Figure 54. Indicative cost breakdown of trackers, by subcomponent.

Sources: (RINA Tech and Array Technologies 2020; NREL 2021)

PV modules that are mounted at a fixed tilt are configured to optimize system performance over the course of an entire year. The farther away a system is from the equator, the greater the tilt angle for optimal design. The mounting design is based on wind load, with more reinforcements (e.g., higher steel gauge) necessary for windier places.

Fixed-tilt mounting structures typically consist of rails connected to rear and front legs (or a single leg), with clamps holding the modules in place. The legs are typically driven into the ground or held in place with concrete. Virtually all components are made of steel or aluminum.

Slanted roofs typically mount racking on the south, east, or west portion of the roof. Because of the tilt, they often penetrate the roof to affix the racking. Commercial rooftop buildings, however, are often flat with the ability to handle significant weight. In these cases, developers often opt for non-penetrating, ballasted systems, which rely on heavy material (i.e., concrete) to keep systems in place.

Like fixed-tilt mounting, most rooftop racking components are made of galvanized steel or aluminum and consist of rails and clamps. They also typically have splice plates to connect the rails (which can be used for grounding) and either a ballasted foundation (used with concrete as the weight) or a roof penetration system.

2.6.2 Industry Overview

Utility-scale PV represents the majority of PV installed in the United States (46 GW_{dc} vs. 17 GW_{dc} and 10 GW_{dc} for residential and commercial and industrial (C&I), respectively), and within that sector over 70% of installed capacity has used single-axis tracking ground-mount structures (EIA 2021a, Figure 55). Residential PV systems almost exclusively use penetrating rooftop mounting. C&I installations have a mix of fixed-tilt structures for ground mount and ballasted rooftop mounting for large, flat rooftops (Figure 56).

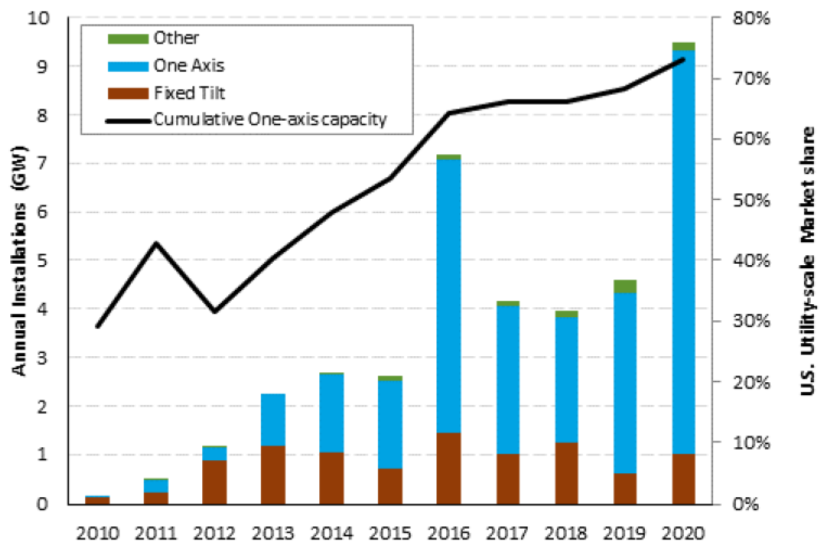

Figure 55. U.S. utility-scale PV installed capacity, by mounting structure.

Source: (Feldman and Margolis 2021)

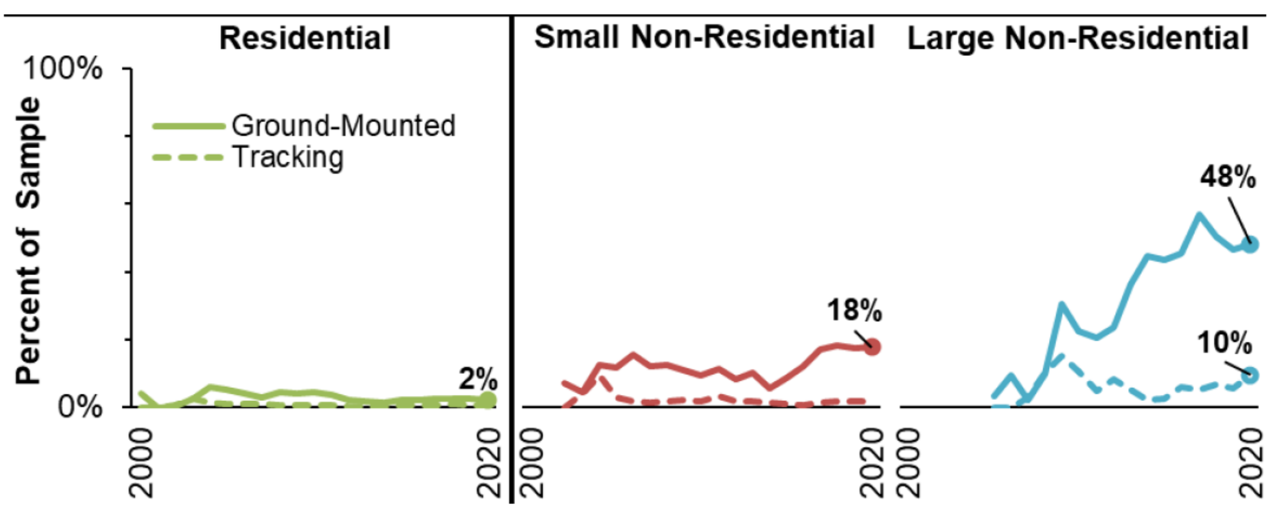

Figure 56. U.S. distributed PV panel mounting trends.

APPENDIX B

Fixed Tilt Mounting System

Tracking Mounting System

APPENDIX C

Table 2 – Categorization of Applicable Project Components

Applicable Project	Applicable Project Component	Categorization
Utility-scale photovoltaic system	Steel photovoltaic module racking (including steel or iron in module rails, support columns, torque tubes, and any other elements that are structural in function)	Steel/Iron
	Pile or ground screw or other foundation structure	Steel/Iron
	Steel or iron rebar in foundation (e.g., concrete pad)	Steel/Iron
	Photovoltaic tracker (but not including steel or iron in module rails, support columns, torque tubes, or any other elements that are structural in function)	Manufactured Product
	Photovoltaic module (which includes the following Manufactured Product Components, if applicable: photovoltaic cells, mounting frame or backrail, glass, encapsulant, backsheet, junction box (including pigtails and connectors), edge seals, pottants, adhesives, bus ribbons, and bypass diodes)	Manufactured Product
	Inverter	Manufactured Product