

A DP WORLD REPORT WITH CANARY CREATIVE

CLOSING THE GAP ON CLEAN ENERGY SUPPLY-CHAIN SUSTAINABILITY



DP WORLD



INTRODUCTION

The world's supply chain continues to take center stage as businesses, governments and households across the globe invest in electric vehicles, renewable energy and electric-powered appliances that can run on that clean energy.

Demand for renewables has grown so significantly that in just one year, the **International Energy Agency** increased its 2022 forecast of renewable energy deployment by 30 percent. The agency now estimates that 2,400 gigawatts of clean energy will be deployed between 2022 and 2027. As business leaders and policy stakeholders work to implement these projects, it will be critical to secure access to the necessary equipment while continuing to decarbonize the supply chain.

The imperative to rapidly deploy clean energy on a large scale has gained momentum due to the pressing issues of climate change and energy security, the latter of which has been heightened by Russia's invasion of Ukraine. The sheer scale of planned deployments has sharpened the importance of uninterrupted access to critical components and materials. To meet these needs, manufacturers are placing a stronger emphasis on ensuring the sustainability, resilience and efficiency of their supply chains.

Manufacturers of solar panels, wind turbines and batteries for electric vehicles and grid storage will see their operations and supply chains held to higher standards than the extractive fossil-fuel industries as regulators, investors and consumers are placing more scrutiny on the supply chain of the growing cleantech industry.

The focus on supply-chain sustainability for the clean energy industry is creating both opportunities and challenges to build geographically diverse suppliers that can meet the escalating demand for renewable energy technologies.

Supply Chains Under Scrutiny

Supply chains are under a magnifying glass, with post-pandemic challenges, environmental concerns and human-rights issues commanding global attention. Against this backdrop of intense scrutiny, the clean energy sector continues to pursue diversification and sustainability, forcing changes throughout the industry. This pivotal moment highlights the broader conversation surrounding supply chains, igniting a sense of urgency around ensuring ethical and responsible practices across the entire supply chain.

In its most recent [State of Supply Chain Sustainability 2022 report](#), the MIT Center for Transportation and Logistics found that the overall importance of supply-chain sustainability is trending upward among the 3,300 global supply-chain professionals it surveyed. MIT defines supply-chain sustainability as managing the environmental and social impacts of sourcing, extracting, manufacturing, product use and end-of-life disposal in accordance with the United Nations' Sustainable Development Goals.

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Another driver of supply-chain sustainability initiatives is the possibility that the U.S. Securities and Exchange Commission could issue a mandate requiring public companies to report Scope 3 emissions, which include emissions created throughout a company's supply chain. While limited in its reach, the impact of Scope 3 reporting is significant enough that many companies that would not fall under the rule may elect to boost tracking of carbon emissions for competitive purposes.

Similar requirements are already law in Europe. In January 2023, the European Union's **Corporate Sustainability Reporting Directive** went into effect. The CSRD requires about 50,000 companies to report information about the environmental impacts of their operations, including supply chain, as well as human rights, diversity and other social metrics.

To better understand how clean-energy leaders are thinking about the resilience and sustainability of their supply chains, Canary Media and end-to-end supply-chain logistics provider **DP World** surveyed a select sample of Canary readers whose companies and organizations are thinking about supply-chain issues and Scope 3 emissions.

An overwhelming 85 percent of survey respondents confirmed that supply-chain sustainability is a priority concern for their organizations.

The main drivers of concern around supply-chain sustainability named by respondents were consumer and investor demand and increased focus by the C-suite on environmental, social and governance (ESG) metrics. But in spite of the increasing motivation to address supply-chain sustainability, many obstacles are challenging that progress.

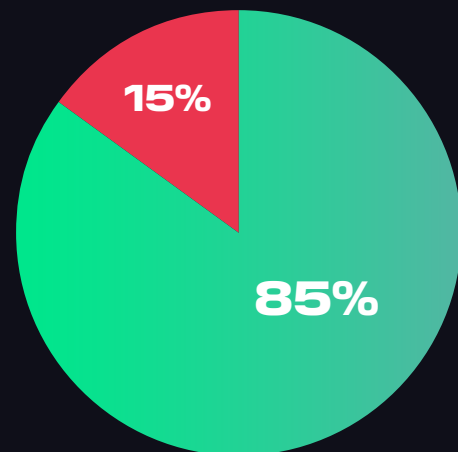
IS SUPPLY-CHAIN SUSTAINABILITY A TOP CONCERN FOR YOUR ORGANIZATION?



Yes



No



Source: Survey of nearly 70 climate and cleantech professionals conducted by DP World and Canary Creative gauged perspectives regarding their organization's approach to supply-chain issues and Scope 3 emissions.

This paper delves into the survey findings and highlights challenges and opportunities to improve supply-chain sustainability, including:

- Why onshoring is not a near-term panacea.
- How a lack of necessary infrastructure inhibits supply-chain sustainability.
- The critical need for data and analysis to drive progress.



THE ONSHORE GAP

One objective of the Inflation Reduction Act (IRA), which was passed in August 2022, was to significantly scale up U.S. domestic manufacturing of clean energy products.

The IRA uses an array of incentives that **include** loans and tax credits, such as the Advanced Manufacturing Production Credit and the Advanced Energy Project Credit, as well as up to \$250 billion in loan authority for the U.S. Department of Energy's Energy Infrastructure Reinvestment Financing program.

The law is already having its intended effect, with about 100 new facilities or factory expansions announced within a year of the bill's passage. In June, for instance, the U.S. Department of Energy announced **\$9.2 billion in conditional loans** for Ford and its South Korean partner SK On to ramp up electric vehicle (EV) manufacturing with three new battery factories in the U.S.

The IRA's incentives have the potential to lower greenhouse gas emissions related to the production and transportation of clean energy products by relocating manufacturing closer to American purchasers, helping to reduce miles traveled and the volume of fuel burned. Domestic manufacturing also reduces the risk that geopolitical disputes will impede access to the critical materials and finished products needed to support the U.S. clean energy transition while reducing dependency on countries with lower standards for labor and other reporting categories.

On the demand side, the IRA features tax credits designed to incentivize the purchase of domestically made clean energy products. For example, the Internal Revenue Service recently issued **guidance** that EV buyers can only claim the maximum \$7,500 federal tax credit if the vehicle being purchased meets specific criteria surrounding critical mineral and battery component requirements, along with assembly in the United States.

The legislation is working. The IRA has unleashed billions of dollars' worth of announced investments across the domestic supply chain, with new projects being announced almost weekly. According to a recent **report** by the industry trade group American Clean Power, more than \$150 billion in capital investments in domestic utility-scale clean energy projects have been made since the IRA was signed into law. That's more than the total combined investments in U.S. clean power projects between 2017 and 2021.

Onshoring Will Not Be Enough to Meet Demand

Despite the billions of dollars flowing into solar panels, energy storage and wind turbines, skepticism abounds that domestic manufacturing can meet a significant portion of U.S. clean energy demand in the near term.

For example, in the survey, nearly half of respondents said they expect domestic supply-chain resiliency to worsen over the next two years because of increasing demand. According to a **report** from the U.S. Department of Energy, more than 85 percent of solar modules installed in the U.S. between 2018 and 2020 were imported.

Additionally, the bulk of manufacturing being announced is for batteries or solar panels that are still sourcing components and raw materials from abroad. Only one solar company, Korea-based Qcells (a subsidiary of Hanwha Solutions), is currently building out a fully integrated silicon-based solar supply chain in the U.S., while other manufacturers primarily rely on ingots, wafers, polysilicon and other materials from China.

GLOBAL PV MANUFACTURING CAPACITY BY COUNTRY AND NREL DEPLOYMENT ESTIMATES

Module capacity values include CdTe and c-Si



Source: U.S. Department of Energy

U.S. will need to invest

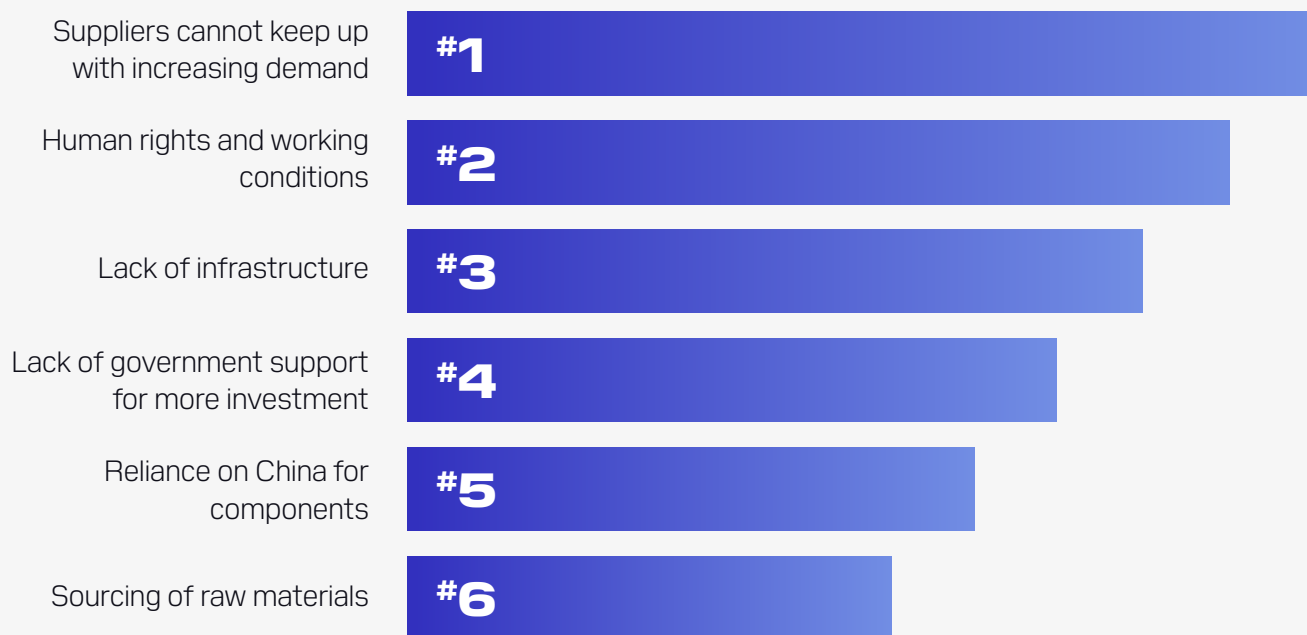
\$175 billion

in the next two to three years to match China's battery production.

The picture is also bleak for the upstream and midstream energy-storage supply chains being onshored quickly enough to meet U.S. demand. A recent EV battery [report](#) by nonprofit think tank RMI states that the U.S. is home to only about 7 percent of the world's battery manufacturing capacity. By contrast, the IEA [reports](#) that China produces three-quarters of all lithium-ion batteries, has 70 percent of the globe's cathode capacity, and processes and refines over half of the world's critical battery materials, including lithium, cobalt and graphite. The RMI report estimates that the U.S. will need to invest \$175 billion in the next two to three years to match China's battery production.

Given the midstream and upstream challenges, onshoring is just one piece of improved supply-chain sustainability that will need to be tackled in the coming years. Strengthening regional supply chains will also be important. Survey respondents cited both nearshoring manufacturing and diversifying supply chains as near-term priorities. But the top concern reported by survey respondents was not where materials were being sourced from but the ability to keep up with demand.

WHAT IS THE BIGGEST CHALLENGE TO SUPPLY CHAIN SUSTAINABILITY FOR THE RENEWABLES INDUSTRY?



Source: Canary Creative/DP World survey (Respondents ranked the challenges from highest to lowest.)

Deploying renewables at scale is front of mind, but industry groups such as the Solar Energy Industries Association have **encouraged** member companies not to source from regions where human-rights abuses have been documented. The industry has even developed a traceability **protocol** so that companies have visibility into where components are manufactured, allowing them to document the use of responsible sources. These industrywide efforts are expected to increase due to pressure from shareholders and policymakers.



THE INFRASTRUCTURE GAP

One of the biggest challenges to supply-chain sustainability cited in the survey is the need for transmission, EV chargers and other infrastructure to allow suppliers to reduce their carbon emissions.

Even as cleantech companies try to deploy more clean energy, their own suppliers may have trouble adopting those same technologies.

These types of chicken-and-egg problems are rife in the clean energy sector. For example, electrifying fleets is a powerful solution for improving supply-chain sustainability, but the global shortfall of utility infrastructure to power charging equipment remains a challenge.

A 2022 [report](#) issued last year by the nonprofit Climate Group found that 122 global companies have committed to electrifying their combined fleets of 5.5 million vehicles by 2030, up from 209,000 fleet vehicles that had been electrified when the report was published. However, the report acknowledges that insufficient charging equipment may prove to be an obstacle.

Acknowledging these hurdles has spurred efforts like the Electric Power Research Institute's EVs2Scale2030 [initiative](#) that aim to reduce the grid constraints hampering EV growth. Similarly, supply-chain capacity is limiting consumer opportunities to purchase EVs. For example, a Sierra Club report found that [66 percent](#) of car dealerships in the U.S. did not have one EV available for sale; of that number, 44 percent said they would sell EVs if the supply chain could deliver them more broadly and ensure support for consumer use.

Marine transportation ports also face infrastructure constraints for improving sustainability. For example, diesel-fueled equipment, vehicles and ships **emit** large amounts of greenhouse gas emissions and other pollutants. Large cargo ships are responsible for about **3 percent** of global emissions and typically run on dirty bunker fuel while docked. The IRA's **Clean Ports Program** allocates \$3 billion to electrify port vehicles and operations. However, as with charging infrastructure for consumer vehicles, upgrading ports with charging infrastructure at the required speed is incredibly challenging. Though it would improve the Scope 3 emissions for all companies whose goods pass through the ports, the disruption, delays and downtime caused by upgrading the infrastructure remain daunting.

The Data Gap

As with pursuing any new business strategy, the lack of data is a significant obstacle for any company pursuing supply-chain sustainability. Accurate data about emissions throughout the supply chain is the foundation for developing reduction strategies and measuring progress. In Europe, logistics companies have a history of collecting and reporting equipment and facilities emissions data, but that is not standard in many other regions.

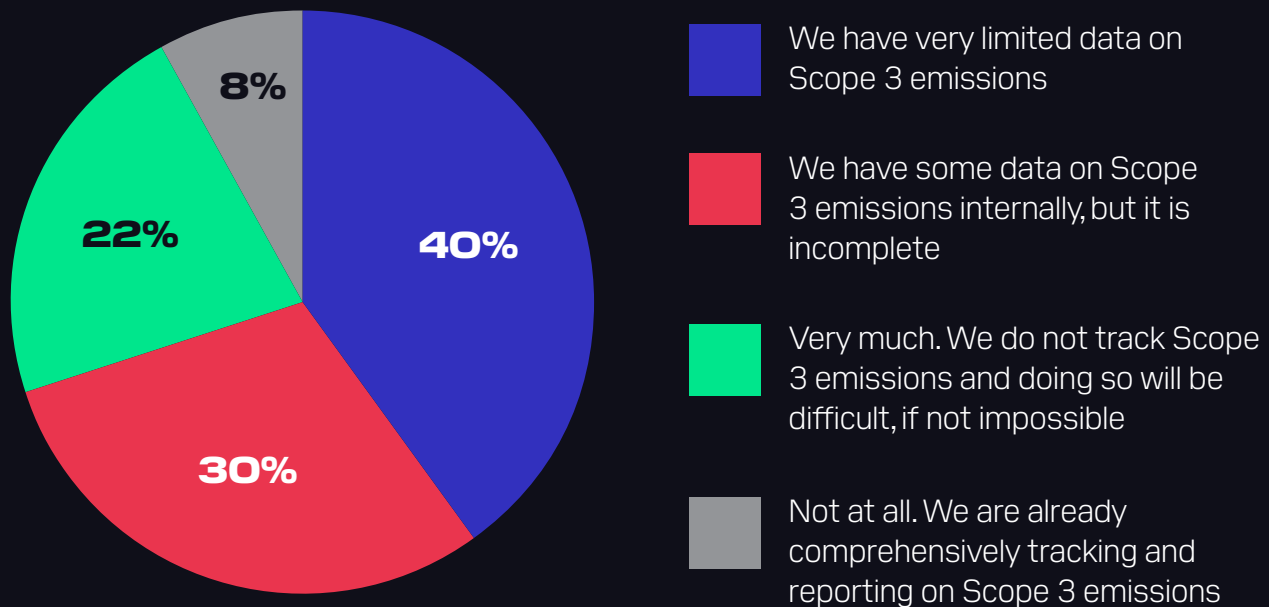
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In the Americas and other regions, accessing similar data can require more indirect mechanisms like requesting invoice data from procurement and finance teams about energy usage, purchased materials and other transactions that generate emissions. This is a particularly formidable task for Scope 3 emissions disclosure requirements, which, according to a **report** from nonprofit CDP, produce an average of five times the emissions of those resulting from direct operations. Some companies are requiring that suppliers report their emissions to qualify to do business with them, while others are calculating Scope 3 emissions by analyzing or auditing their supplier spending.

The Potential for New U.S. Regulations

Most survey respondents stated that their companies were not prepared for accurately tracking Scope 3 emissions. Only 8 percent said they were already tracking and reporting Scope 3 emissions. Seventy percent of respondents said they had either very limited or incomplete data, while another 22 percent said they don't track Scope 3 emissions and that it would be difficult or impossible to do so.

HOW DO YOU EXPECT THE SEC'S PROPOSED RULEMAKING AROUND SCOPE 3 EMISSIONS TO IMPACT YOUR ORGANIZATION?



Source: Canary Creative/DP World survey

Capacity constraints also include a need for more internal expertise to understand the data needs and devise viable solutions to advance sustainability. Because of limited data and a lack of expertise around using that data, there is a dearth of supply-chain experts with a verifiable track record of driving sustainability progress.



CONCLUSION

WHO PAYS FOR SUSTAINABILITY IS IMPORTANT ... BUT MAKING TRUE PROGRESS REQUIRES HAVING BETTER DATA

Building supply chains that meet increasingly stringent ESG requirements demands capacity-building at all levels.

Any honest conversation about supply-chain sustainability must include discussions of who is paying for upgrades to reduce greenhouse gas emissions. These conversations can be complicated. For example, electrification solutions often have high upfront capital expenses but low operating costs that make them a superior financial option in the long term. Small businesses and undercapitalized firms are least likely to be able to afford such upfront costs, but governments and larger companies may have the resources and scale to implement successful programs.

The sheer number of supply-chain players also adds complexity to the price question. For instance, who should pay to add renewable energy to a warehouse operated by a contract logistics firm? It's reasonable for the logistics company to make the investment if they own the warehouse and can offer ESG benefits to a succession of clients. But if the logistics company leases the building, a shared investment between the customer, the logistics company and the building owner may be more equitable.

These challenges can be eased when companies (and consumers) are willing to pay more for supply-chain sustainability. Seventeen percent of the respondents to the survey said they are already paying a premium for

suppliers that rank highly on or exceed ESG requirements. Another 44 percent of survey respondents said they would be willing to pay a slight premium. By contrast, 28 percent of respondents said they would not be willing to pay an ESG premium because cost-cutting was a primary focus of their business, and another 11 percent said supply-chain sustainability is not a current priority.

The first step toward improved supply-chain sustainability is gathering and analyzing comprehensive data about emissions and other environmental impacts. It's the only way to realistically prioritize investments and partnerships at each stage of the supply chain that will reduce emissions and improve sustainability.

Data analysis can also show that being more sustainable doesn't always cost more. Sometimes, it just requires doing business differently, such as choosing to route goods through ports that have embraced electrification and automation.

Supply-chain sustainability is a clear opportunity to stand out among competitors and potentially reduce costs, but it is also a severe challenge. And the only way to make sound decisions that can optimize supply-chain sustainability is by adopting a holistic view that only data can provide.

Transitioning to cleaner and more renewable energy sources will diversify energy availability across geographies, limit exposure to geopolitical conflicts and improve the environment. The next few years will be vital to ensuring continued growth in the cleantech sector to meet demand. For the clean energy industry, the need to deploy at speed and to demonstrate success and cost-effectiveness are necessities, but without improved data, many efforts will limit their own returns.

ABOUT US



DP WORLD

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With a dedicated, diverse and professional team of more than 103,000 employees spanning 75 countries on six continents, DP World is pushing trade further and faster towards a seamless supply chain that's fit for the future.

We're rapidly transforming and integrating our businesses – Ports and Terminals, Marine Services, Logistics and Technology – and uniting our global infrastructure with local expertise to create stronger, more efficient end-to-end supply chain solutions that can change the way the world trades.

What's more, we're reshaping the future by investing in innovation. From intelligent delivery systems to automated warehouse stacking, we're at the cutting edge of disruptive technology, pushing the sector towards better ways to trade, minimising disruptions from the factory floor to the customer's door.

WE MAKE TRADE FLOW TO CHANGE WHAT'S POSSIBLE FOR EVERYONE.

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