



# Is net zero achievable? Yes, if we solve the renewable energy supply chain puzzle

Attracting talent and fostering collaboration and transparency are key to renewable energy supply chain resilience and the sector's contribution to net zero emission ambitions.

In 2024, the renewable energy sector finds itself at a pivotal juncture. The push for clean energy, coupled with ambitious climate targets, has set the stage for significant growth. However, this expansion is not without its complexities.

The push to achieve net zero emissions (NZE) will require a strong, secure, and sustainable supply chain to deliver an effective energy transition.<sup>1</sup> This puts the spotlight on the supply of minerals, materials and manufacturing capacity needed to deliver on NZE.

In this insight — which call on perspectives from [WTW's latest Renewable Energy Supply Chain Risk Report 2023](#) — we consider global renewable energy supply chain challenges and provide pathways for overcoming these obstacles to build the resilience the sector will need to make a substantial contribution to reaching net zero.

## Tackling raw material shortages and dependencies

The renewable energy sector heavily relies on critical raw materials such as lithium, cobalt, nickel and graphite for technologies like batteries and solar panels. According to the International Energy Agency<sup>2</sup>, China accounts for 60% of global turbine capacity and half of total exports, as well as a large proportion of solar panels, batteries and heat pumps. This concentration of production creates vulnerabilities and supply chain risks.

To overcome this obstacle, the sector should focus on diversifying its supply chain by exploring alternative sources and developing partnerships with new suppliers. Investing in research and development to find alternative materials or improve recycling processes can also help reduce dependencies and ensure a steady supply of critical raw materials.

<sup>1</sup> H. Mountford, D. Waskow, L. Gonzalez, C. Gajjar, N. Cogswell, M. Holt, T. Fransen, M. Bergen and R. Gerholdt (2021), COP26: Key Outcomes From the UN Climate Talks in Glasgow, <https://www.wri.org/insights/cop26-key-outcomes-un-climate-talks-glasgow>

<sup>2</sup> <https://www.iea.org/reports/renewables-2023/executive-summary>

## Navigating geopolitical risks and trade tensions

Geopolitical tensions and trade disputes can disrupt supply chains and hinder the growth of the renewable energy sector. For example, conflicts in countries that produce critical minerals can lead to shortages and price volatility. According to our Renewable Energy Supply Chain Risk Report 2023, 25% of respondents rated geopolitical risk as having a high impact on supply chain risks, while 57% rated it as having a medium impact. To mitigate these risks, the sector should actively engage in diplomacy and advocacy efforts to promote stable trade relationships and reduce geopolitical tensions.

Collaborating with governments and international organizations can help create a more favorable environment for renewable energy supply chains. Investing in local manufacturing capabilities and reducing reliance on imports can also enhance supply chain resilience and reduce exposure to geopolitical risks.

## Overcoming renewable energy skills gaps

The rapid growth of the renewable energy sector has created additional demand for a skilled workforce, including engineers, technicians and project managers. However, there is a shortage of qualified workers, which can lead to delays and inefficiencies in supply chain operations. According to our Renewable Energy Supply Chain Risk Report 2023, 32% of respondents ranked supplier difficulties in attracting and retaining talent as one of the top factors underlying supply chain risks.

To address this challenge, the sector should invest in workforce development programs, including training and education initiatives. Collaborating with educational institutions and industry associations can help bridge skills gaps, ensuring a steady supply of skilled workers. Moreover, promoting diversity and inclusion in the sector can attract a broader talent pool and foster innovation.

## The role of supply chain visibility and transparency in building resilience

Ensuring end-to-end visibility and transparency in the supply chain is crucial for identifying vulnerabilities and mitigating risks. The renewable energy sector should leverage digital technologies and data analytics to enhance supply chain visibility. According to our Renewable Energy Supply Chain Risk Report 2023, 51% of respondents identified using supply chain mapping software as one of the measures that would have the greatest impact on managing supply chain risks.

Implementing supply chain management systems and using blockchain technology can provide real-time tracking of materials, components and equipment, enabling proactive risk management.

Fostering collaboration and information sharing among stakeholders, including suppliers, manufacturers, and project developers, can improve transparency and facilitate risk assessment and mitigation.

## Harnessing collaboration to create stronger renewable energy supply chains

Building a resilient supply chain requires collaboration and partnerships across the renewable energy sector. Stakeholders should work together to share best practices, exchange knowledge and develop common standards for supply chain resilience. According to our Renewable Energy Supply Chain Risk Report 2023, 62% of respondents identified improving relationships with suppliers and customers as one of the measures that would have the greatest impact on managing supply chain risks.

Collaborative initiatives can include joint research and development projects, information sharing platforms and industry-wide risk assessments.

Again, by fostering a culture of collaboration, the sector can collectively address challenges and build a robust and sustainable supply chain.

Figure 1:

## WTW Renewable Energy Supply Chain Risk Report 2023: Five key findings

**74%** of business said losses related to the supply chain had been higher or much higher than expected over the last two years.

**44%** named a shortage of raw materials to be among the biggest supply chain factors expected to impact their businesses over the next two years, topping the list of concerns.

**84%** said they have made at least some improvements in their approach to supply chain management in response to the pandemic.

**85%** said a lack of data, knowledge and understanding were among the factors posing the greatest challenge to addressing risks over the next three to five years.

**80%** agreed or strongly agreed that a lack of alternative suppliers impeded their ability to implement an effective dual or multi-source strategy.

## Looking back and the roadmap to a resilient future

Lack of investment has made the global energy system vulnerable to the level of shocks we saw in 2022.<sup>3</sup>

Investment shortfalls in the coming years will have a major impact on countries' and governments' ability to achieve the 2030 and 2050 targets on reducing the gap on global warming to 1.5 degrees and eventually achieving NZE in the long term.<sup>4</sup>

The International Energy Agency estimates it will require a near-tripling of investment in clean energy infrastructure to 2030 get the world back on track to achieve NZE, potentially more than this level in developing countries.<sup>5</sup>

Delivering this will take unprecedented levels of support and cooperation from governments — many of which are pursuing energy independence — as well as private and public sector enterprises.

Investment in manufacturing capacities in multiple geographies to keep up with the needs and demands of the renewable energy industry across all technologies such as wind, solar, hydrogen and battery storage is the first step.

The second step will be for governments, authorities, agencies and other stakeholders to focus on reducing the barriers to ramping up renewable energy projects. Such moves include increasing the investment in the infrastructure eco-system, such as the roads, ports, and grid systems, needed to make renewable energy projects and the associated supply chains viable.

The final step is for both the private and public sector to do more to attract more people into this sector. Bridging the renewable energy skills gap will require a drastic increase in the workforce available to ensure the sector's wider goals are deliverable.

As daunting as these upfront costs are, the long-term payoffs from an economic and an environmental perspective may prove invaluable. As Barack Obama said in 2009, "To truly transform our economy, protect our security, and save our planet from the ravages of climate change, we need to ultimately make clean, renewable energy the profitable kind of energy."<sup>6</sup>



**John Abraham**

Senior Associate and Deputy Team Leader,  
Renewable Energy division, WTW London.  
[john.abraham@wtwco.com](mailto:john.abraham@wtwco.com)



<sup>3</sup> IEA (2020), Renewable energy market update, IEA, Paris <https://www.iea.org/reports/renewable-energy-market-update>

<sup>4</sup> United Nations (2022), Renewable energy — powering a safer future, <https://www.un.org/en/climatechange/raising-ambition/renewable-energy>

<sup>5</sup> IEA (2022), World Energy Outlook 2022, IEA, Paris <https://www.iea.org/reports/world-energy-outlook-2022>

<sup>6</sup> <https://www.theguardian.com/world/2009/feb/25/barack-obama-green-economy-environment>