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How Lean Digital Supports Companies in Achieving Net-Zero Supply Chains

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SUPPLY CHAIN SUSTAINABILITY HAS BECOME KEY TO THE FIGHT AGAINST CLIMATE CHANGE. AS THE BIGGEST SOURCE OF CARBON EMISSIONS FOR THE MAJORITY OF COMPANIES, SUPPLY CHAINS GENERATE AS MUCH AS 80 PERCENT OF THE WORLD'S TOTAL CARBON EMISSIONS.

Meanwhile, the global drive to decarbonization is sparking a race for competitiveness and market share around the world. The good news is that the transition to net-zero required by new legislation in many countries and set forth by the Paris Agreement is creating enormous economic opportunities in new markets, businesses, fuels, and trade.

Companies seeking to position themselves for success are setting ambitious goals to reach net-zero energy usage and emissions production while simultaneously addressing growing disruption from extreme weather caused by climate change. Almost half of all CEOs surveyed for a recent report by the United Nations Global Compact (UNGC) - Accenture said that their companies are experiencing significant supply chain disruptions as the result of extreme climate events.

"Supply chains represent both a large source of emissions and a large percentage of operating costs, and they are also susceptible to disruption by climate change events such as natural disasters," says Seif Shieshakly, Co-Founder and Managing Partner of Four Principles. "Companies across all market sectors are rethinking all aspects of the supply chain, from the materials used in packaging and the vehicles employed for transport to where factories and employees are located and the most optimal ways to meet consumer demand."

Challenges to Creating Net-Zero Supply Chains

Building a net-zero value chain is a complex process requiring transparency, data-sharing, and collaboration. The challenges companies face include everything from target formulation and validation to financing innovation to reducing carbon-intensive transport.

In addition to reducing production emissions, companies must tackle Scope 3 emissions, the indirect upstream and downstream emissions that result from company operations. Typically, the largest part of a company's carbon footprint, Scope 3 emissions can be more than ten times larger than Scope 1 and 2 combined. Achieving net-zero in other areas of the supply chain requires supplier buy-in, transparency, and engagement. A barrier is the problem of measuring Scope 3 emissions, which only 16 percent of companies report being able to do at an advanced level, according to the UNGC-Accenture study.

Decarbonizing global supply chains is also, unfortunately, very expensive. In a new report, Delivering Net Zero Supply Chains, HSBC and Boston Consulting Group (BCG) find that a US $100 trillion investment into small and medium enterprises (SMEs) will be required to enable these resource-challenged companies to participate effectively in the movement to green supply chains.

Surveying 126 HSBC clients in the sectors of automobile and textile production, the report found that while more than half of large corporations reported having a Net-Zero transition plan, very few of the SMEs were so prepared. Barriers included lack of knowledge, resources, and incentives, as well as lack of capacity for costly data gathering and reporting. Broken down annually, up to US $2.8 trillion a year between now and 2050 will be required by SMEs to reduce the carbon footprint of global supply chains to zero.

All sectors of the economy face challenges in a Net-Zero transition, but some sectors, such as coal and gas and automotive, face more exposure because they directly produce more significant greenhouse gas emissions or sell products that emit greenhouse gases. Other sectors facing greater challenges include industries like construction and mining, with high-emission supply chains.

Difficulty measuring environmental, social and governance (ESG) data across the value chain was reported as a major obstacle to sustainability by 63 percent of the CEOs surveyed in the UNGC—Accenture CEO Study.

Transitioning to a Net-Zero supply chain will in most cases require a complete re-evaluation of product design and delivery. Companies looking to reduce Scope 3 emissions must collaborate with partners and innovate new products, processes, and services.

“Future-oriented industries and companies will see that economic opportunities are there for those ready to lead the way,” says Mehdi Chelhi, Principal at Four Principles. “But it will require investment in research and development to rethink product design, innovate processes, and encourage collaboration between industry, science and finance.”

How Lean Digital Helps Develop Net-Zero Supply Chains

The goal of Lean Digital Enterprises is to create a supply chain that flexibly adapts to customer demand and values while continually eliminating waste and streamlining required resources.

The COVID-19 pandemic upended supply chains as never before, revealing weaknesses in their systems that many companies had not previously been aware of. Lack of visibility, sluggish responsiveness to rapidly changing conditions, and over-correction in response to supply and demand shocks plagued companies with outdated systems and processes.

Lean Digital Transformation is proving essential to re-establishing these supply chains, while also providing opportunities for waste reduction and increased efficiency and responsiveness. Lean Digital Manufacturing and Production seeks to eliminate waste and optimize operations across all steps of a process. Lean Digital is all about doing more with less: creating better quality products in less time with the minimum effort at the greatest savings in cost and waste.

The Lean Digital Supply Chain of the future must conform to the Three Rs: Relevant, Resilient, and Responsible. What relevance means in this context is responding instantaneously – or as rapidly as possible - to customer- and market-driven changes. Relevance also relates to customization, as Lean Digital companies seek to provide curated experiences for customers based on their unique needs. Leading supply chains are pursuing hyper-personalization according to customer profiles and following the model of product-as-a-service.

Resilience is where greening the supply chain has the most direct effect, because understanding climate risk exposure and defining a net-zero business model are among the best strategies for building physical resilience and climate-proofing operations in today’s unstable environment.

As to the third R, companies and their supply chains must evolve to operate more responsibly in ways that comply with ESG data, rules, and regulations and establish and build trust with stakeholders. This includes cultivating a reputation for environmental stewardship, which is increasingly important to customers and essential to attracting and retaining top talent.

Digitization and Lean Partner to Produce Enhanced Benefits

Enterprises that have implemented Lean know the importance of advanced digital technologies and data to drive up both efficiency and sustainability. In fact, the use of Industry 4.0 digital technologies has become a key differentiator between companies that successfully weathered the storms of the past two years and those struggling to survive.

Smart technologies and analytics and AI-powered demand forecasting will be key to meeting ambitious goals for emissions reductions and energy efficiencies over the next five years.

Through the Lean Digital framework, companies can take advantage of smart technologies like AI, robotics, and machine learning, the Industrial Internet of Things (IIoT), cloud computing, and virtual reality to achieve digitization and eliminate waste throughout the supply and production pipeline. Predictive maintenance, for example, prevents potential equipment failures ahead of time, avoiding the cost and energy waste of unexpected downtime.

Lean Digital Management utilizes real-time key performance indicators (KPIs) and key performance predictors (KPPs) to analyze what is happening in a supply chain at the current moment, as well as to predict what will occur in the near future.

Autonomous and remote operations will be another key driver of sustainability, as data show that Lean Digital companies employing a more diverse and globally dispersed workforce experience greater resilience in the face of weather and other climate-related disruptions.

Lean Digital Manufacturers have embraced the use of the digital twin, which partners with supply chain data management to model supply chains in real time. Lean Digital Enterprises use digital twin technology to test scenarios for improving resilience and reducing emissions, while also maintaining the production standards necessary to provide superior customer service.

Technological innovations like Intelligent Execution Control Towers are used by Lean Digital Enterprises to monitor conditions across the supply chain and take action in real time, with minimal human intervention. Likewise, blockchain can enable real-time carbon transparency across the supply chain.

Reaping the Benefits of Net-Zero Supply Chains

Enterprises taking steps towards a net-zero supply chain are already showing quality improvements, cost savings, and other results that suggest these steps will become essential to market leadership.

Orange, a global Telecom operating in 18 countries in the Middle East and Africa as well as in Europe, established the Engage 2025 strategy to receive at least 50 percent of its energy from local renewable sources by 2025 and achieve Net-Zero carbon emissions by 2040.

In Jordan, Orange developed a partnership with Energy Services Companies (ESCO) to establish three solar farms that now provide Orange Jordan with 70 percent of its electricity. This is just one of many such projects currently in the works; Orange has deployed 4,750 solar sites in Africa and the Middle East to supply the company's mobile systems, now preventing the emission of more than 120,000 tons of CO2 each year.

Through a variety of initiatives, Orange has already reduced the company's CO2 emissions by 64.2 percent per customer use since 2016 and is on track for their 2040 objective. Orange Middle East and Africa adopted a new videoconferencing system that connects its headquarters in Casablanca with18 countries across the continent, reducing travel by 25 percent between 2019 and 2021 independent of COVID-19 restrictions. The company is increasing the efficiency of its server network and IT systems and reducing energy consumption through its Green ITN initiative, which replaces equipment to reduce waste and increases the use of solar energy. Between 2010 and 2019 Orange achieved savings of 7.2 Twh (terawatt-hour) of electricity and 365 liters of fuel oil, which is the equivalent of 3.5 million tons of CO2.

One of the first in the oil and gas industry to make a net-zero carbon commitment, Baker Hughes promised in 2019 to reduce emissions by 50 percent by 2030 and net-zero by 2050. The global energy technology company with more than 80 years of operations in Saudi Arabia and the Middle East is already announcing results from the initiative, which include a 15-percent reduction in Scope 1 & 2 emissions compared with 2019, their base year. The company, which operates more than 10 facilities focused on manufacturing, maintenance, services, training, and research and development, now produces 22 percent of its electricity from renewable and zero-carbon sources. In another decarbonization achievement, 5,789 employees are enrolled in Employee Resource Groups (ERGs) as of 2020.

In addition to reducing scope 1 & 2 emissions from its own manufacturing processes and energy usage, Baker Hughes is working to green its supply chain by implementing a comprehensive sustainable supply-chain framework. A comprehensive plan integrating eight strategic decarbonization pathways commits the company to deploy the most efficient emissions management solutions, introduce new and less emissive technologies, and employ intelligent asset management and optimization. Efforts are underway to reduce Scope 3 emissions both upstream and downstream in the areas of supply sourcing; haulage; disposal and treatment of waste; and customer use of company products and services.

In recent years, Baker Hughes has been expanding its presence in Saudi Arabia and elsewhere in the Middle East, recently breaking ground for a new Oilfield Services (OFS) regional hub located at King Salman Energy Park (SPARK.) The company announced that the facility, which will be the company's largest assembly, maintenance, and overhaul hub in the Eastern Hemisphere, will help create an additional 120 jobs, with 70 percent of the 600-plus employees being Saudi nationals.

This is Baker Hughes' second facility at SPARK; its joint venture with Saudi Aramco, Noel Non-metallic Solutions, broke ground in December 2020. In 2019, the company opened a new wellhead facility in Abu Dhabi to support assembly, repair, and field services for customers in the UAE and across the Middle East.

Positioning itself to lead the way in the energy transition, Baker Hughes is investing in and accelerating the adoption and deployment of new fuel sources and clean technologies including hydrogen; geothermal energy; carbon capture and storage; and net-zero liquefied natural gas (LNG.)

Success stories are turning up in nearly every market sector and area of the globe.
Consumer retail giants Walmart and Tesco have been leaders in supply chain decarbonization, both launching large-scale projects to eliminate greenhouse gas emissions from their supply chains by rewarding suppliers that meet ambitious sustainability goals with preferential financing.

To facilitate suppliers' taking on leadership roles in the move towards sustainability, Nike recently launched a Suppliers Sustainability Council (SSC) with representation from ten of the company's largest footwear and clothing partners, which together account for more than 60 percent of Nike's production volume.

The council identified specific areas of focus, including spiking energy costs, the impact of increasing temperatures on employees' work conditions, increasing intensity and frequency of extreme weather events, and new government regulations and carbon taxes. Another new Nike initiative, the Supplier Climate Action Program (SCAP) aims to help suppliers conduct corporate greenhouse gas inventories, set goals for Scope 1 and 2 emission reductions, and develop long-term climate mitigation plans that align with Nike's science-based targets for 2030.

Nike is already seeing results from SCAP, with some suppliers announcing ambitious goals for emission reductions across their entire Scope 1 and 2 footwear and clothing production footprints, not just in goods supplied to Nike. The company says that if suppliers meet these targets, it will result in a 42-percent decrease in baseline emissions over 10 years, the carbon equivalent of taking 300,000 passenger vehicles a year off the road.

“It’s early, but already we see companies benefiting from taking a pioneering role in the Net-Zero movement,” says Patrick Wiebusch, Co-Founder & Managing Partner of Four Principles. “Lean Digital methodology supports the innovation and continuous improvement they need to meet these formidable challenges.”

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