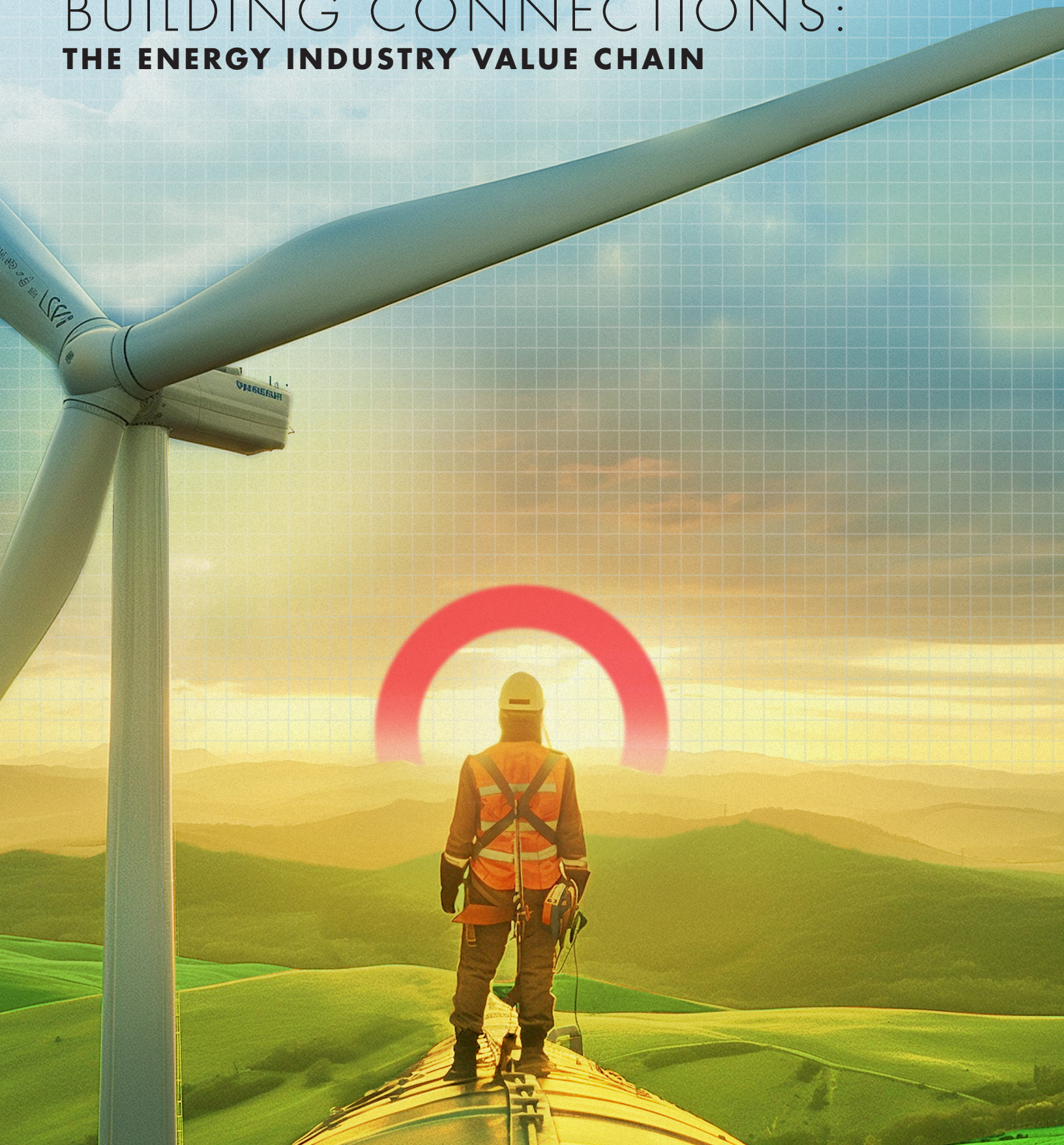


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BREAKING SILOS, BUILDING CONNECTIONS: **THE ENERGY INDUSTRY VALUE CHAIN**





Foreword

Energy companies are used to dealing with uncertainty,
but the volatility they have experienced this decade is almost unprecedented.

Between extreme weather events, geopolitical conflict, health crises and regulatory pressure toward the energy transition, the 2020s have been defined by immense upheaval. Navigating this upheaval, and emerging with its profit margins intact, will be the energy sector's greatest challenge yet.

Delivering multiyear decarbonization and digital transformation strategies, while meeting shorter-term regulatory and stakeholder demands, will test even the most visionary and high-performing energy companies. Companies that are locked in rigid and siloed business models will struggle to survive this ongoing turmoil.

The new realities of the sector demand a strategic assessment and reinvention of the many ways in which energy businesses create and monetize commercial value. That requires the ability to understand, transform and optimize the energy value chain, from production to consumption.

Climate policy and regulation are driving change in the energy sector's value chains. With significant value coming from government credits and incentives, the ability to differentiate in the market will become even more difficult.

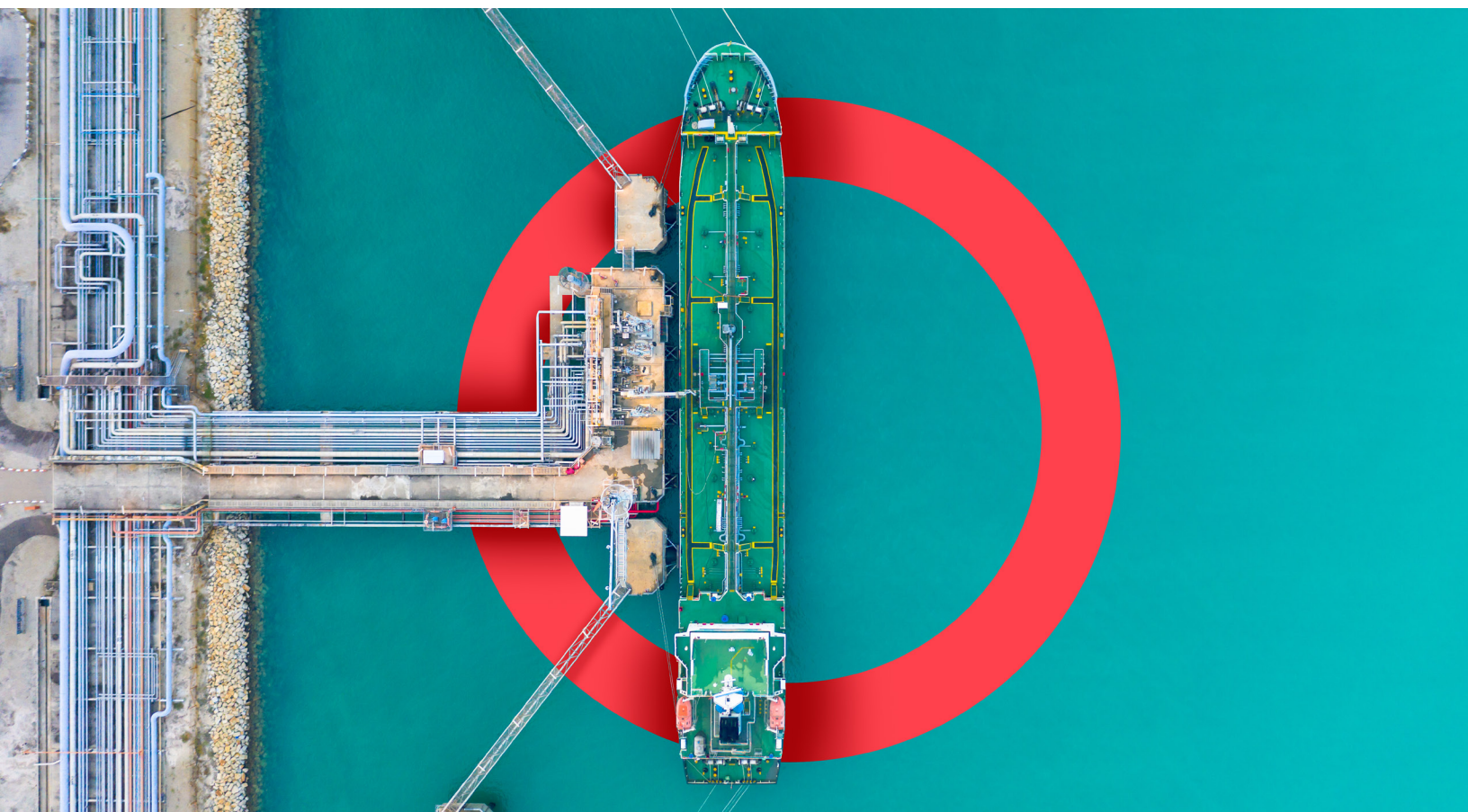
Achieving long-term decarbonization while meeting short-term profit goals will require energy companies to monitor and manage their entire value chains. But their ability to do so is undermined by persistent data silos, especially within organizations themselves.

Value chain modernization, or VCM, refers to the adoption of new business practices and digital technologies that improve the efficiency, profitability and sustainability of the value-creating processes that span organizations and corporate divisions. The era of standalone company divisions [pioneered by Alfred P Sloan](#) one hundred years ago needs to give way to efficient organizations utilizing the power of digital technology to span the company.

Unless they can break down their divisional silos, companies will be stuck with work practices and organizational cultures devised for a world that no longer exists. This report offers a roadmap to do so, ensuring success in this volatile energy industry landscape.

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Chapter 1: The energy transition will not be possible without VCM

Decarbonization is driving long-term change in the energy sector, but businesses need short-term profits to reinvest for the future. Aligning these interests requires a holistic view of the value chain.

In the last 10 years, growing awareness and alarm over climate change has stoked a crescendo of policy and regulatory interventions. Today, this is the single most disruptive force in the energy sector, and it fuels change in the sector's value chain activities.

In the United States, the Inflation Reduction Act [provides almost \\$400 billion](#) in funding for the businesses in all sectors to invest in renewable energy. This presents both [opportunities and challenges](#) to energy companies: It might help finance their own energy transitions but will also accelerate disruption in their markets.

In the European Union, the Renewable Energy Directive has set a binding target for [at least 42.5 percent of the bloc's energy](#) to come from renewable sources by 2030. Middle Eastern countries have made similar commitments: The UAE is aiming for [44 percent renewable energy by 2050](#), while Saudi Arabia has a more ambitious target of [50 percent by 2030](#).

Energy organizations are adopting many strategies to meet these goals and satisfy regulations, and digital tools are often at the heart of their methods. An analysis from BDEW, the German Association of Energy and Water Industries, revealed that [54 percent of companies believe](#) that digital strategies are important to their sustainability initiatives—yet only 20 percent have a digital plan that unites their entire value chain.

Companies also understand the consequences of being unprepared for digitalization. A survey conducted by LF Energy, the Linux Foundation's energy initiative that aims to strengthen American grids, determined that one-third of respondents believed that being ill-prepared for digitalization [would make them less competitive](#) in the sector.

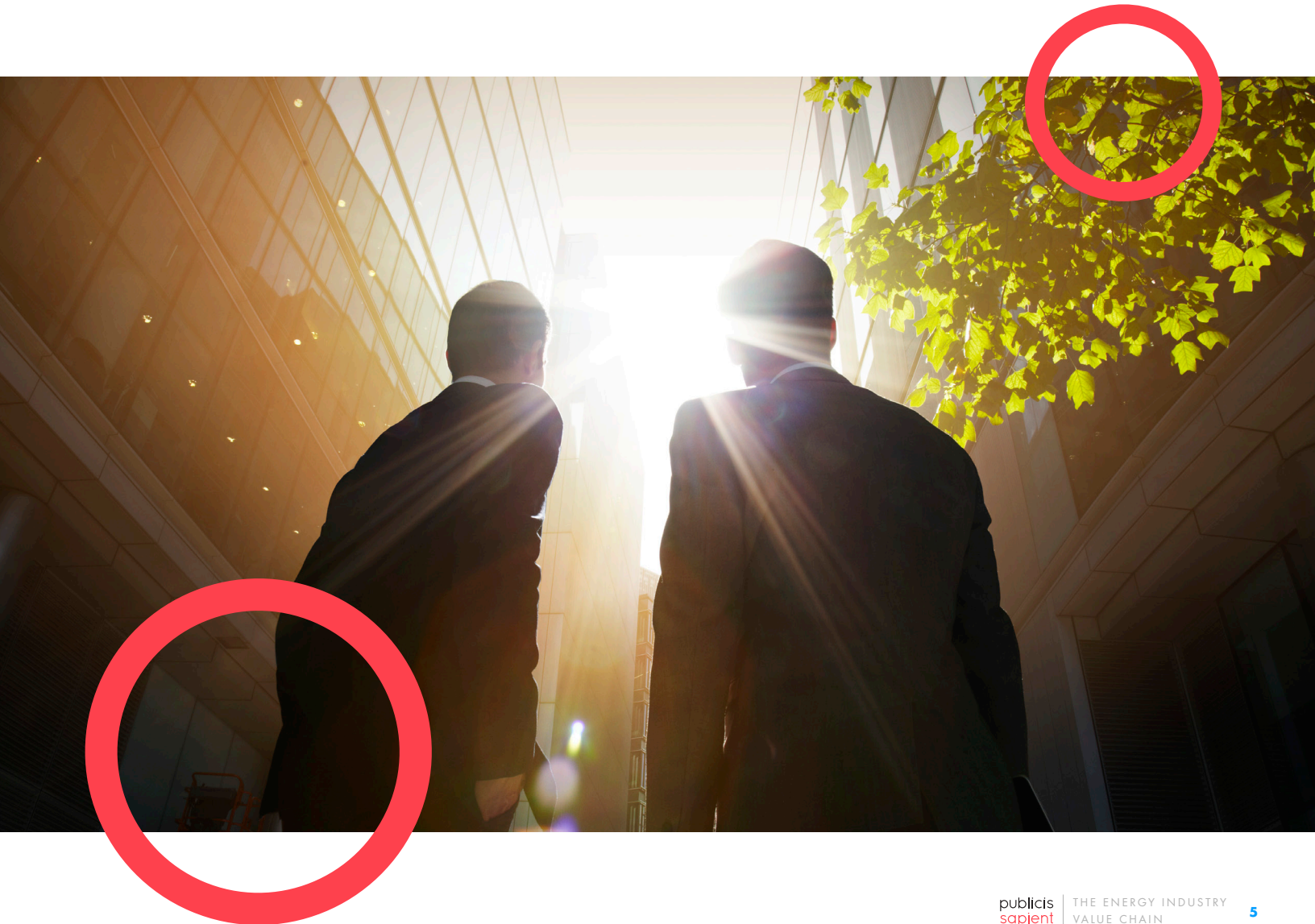
Making decarbonization profitable

Decarbonization is a long-term program for the energy sector, one that has the potential to be profitable over time. Oxford University researchers estimate that moving to an energy system without carbon would save [\\$12 trillion worldwide](#) by 2050.

But how do companies get there? “This is really a strategic issue,” explains Ron Armstrong, a consultant with significant refinery strategy and operations experience at U.S. Downstream company Phillips 66.

The fact that these market changes are being driven by government policy, he adds, means it is challenging to build a business around. “Decarbonization is only economical, in a lot of instances, because of government incentives. But will those incentives remain in place long term at the levels they are today?”

Meanwhile, energy companies are under pressure to deliver short-term profits, as they always have been. Executives do not expect decarbonization to be a significant source of profit in the near future, however, and often focus instead on transforming customer experience or other profit drivers.



Making decarbonization pay

Decarbonization has the potential to create new, profitable opportunities across all parts of the value chain for energy companies:

PRODUCTION

- Renewable power generation assets can be more affordable to source
- Sustainably produced transportation fuels will play a crucial role in ensuring a smooth energy transition

WHOLESALE

- Carbon credits generation and delivery can be used as both a requirement and a service
- Farmer engagement could change the food supply chain

DISTRIBUTION

- Digital transformation of grids will support renewable energy adoption
- Further integration of solar and wind into real-time trading environments

RETAIL

- [EV charging](#) will change the customer landscape
- Customer centricity will generate opportunities to upsell and cross-sell, such as through [retail media networks](#)

Indeed, companies can employ certain strategies that link decarbonization to the customer experience. The growing adoption of electric vehicles, for example, has opened new possibilities for the fuel retail experience.

United Kingdom [energy giant BP announced](#) that all visitors to its new Gigahub charging point in Birmingham will have access to drive-thru food and beverage options, “combining fast charging with convenience to deliver the services EV drivers want while they wait.”

Other companies are making short-term investments in more profitable business lines to fund their longer-term decarbonization strategies. “Sometimes you’ve got to make sure your current business is able to fund the next business,” says Joe Tabita, international energy and commodities lead at Publicis Sapient.

This is beginning to bear fruit. One Publicis Sapient client invested significantly in wind and solar generation to diversify from natural gas. The client has spent the past 18 months integrating these sources into the business end and, this year, they will account for 80 percent of their profits.

Meanwhile, there are transitional strategies that can help energy companies build up their green credentials. For oil and gas companies, these include trading in more (if not entirely) sustainable commodities, such as wind or solar, or bundling carbon credits with other products.

But all these strategies require energy companies to understand their value chain—the value-creating processes that span their supply chains, internal operations and distribution channels, and which encompass external partners as well as internal divisions.

“Companies can only commercialize and properly measure decarbonization if they consider the whole value chain,” explains Tabita. “It is all very well creating lots of bespoke new energy products, but if they cannot access data across all the divisions, they will find it very hard to measure their success.”

Without this holistic view, energy companies may find themselves stuck with a business model designed for a bygone era. But first, they must overcome their internal silos.



Chapter 2: Internal silos are the gravest threat to value chain modernization

Overcoming data silos—and the organizational divisions that create them—is fundamental to VCM success.

Surviving the energy transition with their profit margins intact will require companies to monitor and manage the value-creating processes that span their operations and supply chains. This cannot be done without visibility across and throughout that value chain.

Without these insights, energy companies are limited in their ability to manage their value chains in response to a changing environment.

Barriers to VCM

So, what's preventing energy companies from getting a handle on their value chains?

Barriers to value chain transformation include three types of silos:

- 1. Data silos that prevent information exchange and analysis.**
- 2. Organizational silos that limit coordination, misalign incentives and dilute business benefits.**
- 3. Work process silos that are information constrained and limit an organization's ability to forecast supply and demand.**

Together, these barriers articulate the case for VCM. “The whole concept of VCM is rooted in the fact that when a company organizes itself into departments or divisions, those groups naturally measure their performance against their own benchmarks,” explains Armstrong. “This means that people are often incentivized to make money for their silo, not the company as a whole.”

“The inability to perceive the value chain that spans internal divisions—and external partners—blinds companies to the value that resides in the gaps between them,” he adds. “There's value in the gap between those organizations, or between those silos, and if somebody is not looking across the entire value chain, you may not be able to capture it.”

During a recent earnings call, Brian Partee, SVP of Global Clean Products for Marathon Petroleum stated, “We really have the team relentlessly pursuing value capture. We've got the team consolidated into really one functional team across the entire value chain, which historically was divided up into multiple silos.”

Value chain leadership

Overcoming these organizational barriers to value chain transformation is, in large part, a leadership challenge.

“Leaders must make it clear that divisions are expected—and empowered—to make decisions in the interest of the whole organization, not just their own profit and loss,” says Armstrong. And they must make sure their incentive structures reflect this.

“People will understand [VCM] when they see executive management backing up their words with actions,” he says, “and when they see that it in their year-end bonus.”

Often, the ability of an organization to collaborate across its value chain depends on the willingness of specific key individuals. “If you have somebody in one silo who understands the overall value, they can persuade the decision-maker in another silo, and then you can get it done,” Armstrong explains.

But any work process that is based upon individual conduct alone is not sustainable for the long term. In this scenario, the value chain optimization might cease when those key individuals change jobs. Instead, companies need a more stable and systematic approach for VCM.

“The best way to drive that approach is through a platform utilizing digital technology,” says Tabita. “If you look at an oil company, they’ll have a refinery business which is run by the people in charge of the refineries. They’ll have a supply, trading and wholesale business which is run by commercial leaders. And they’ll have a distribution business which is run by the marketing and retail leaders.”

“The whole point of the value chain concept is that you need to optimize across all of those divisions, and a human brain can’t do that. You can only do it with technology.”

For Zhanna Golodryga, Phillips 66’s EVP of Emerging Energy and Sustainability, technology fuels transformation. At a recent investor day, she credited Phillips 66’s success with its ability to capitalize on data: “One of our biggest assets is data. And so that kind of gave us an opportunity to do things differently. By building off that digital foundation, we could do our organization redesign, literally changing our ways of working and how we operate as an organization. [...] [We must] take advantage of all the data that we have across all the business units to make the right decisions at the right time.”



Data silos

Energy companies' data can be just as fragmented as their value chains, and data silos are often a symptom of organizational divisions. The way in which data is stored, analyzed and communicated often favors the division that first collects it, and they are unlikely to make it more accessible without an incentive to do so.

Don't underestimate data quality

Trustworthy data is not only integral to the reliability of energy systems; it will be vital to the success of any VCM initiative.

With many national governments and the EU now imposing record fines on companies with poor data controls¹, companies need to put data quality and security higher up their VCM agendas.

¹ <https://www.enforcementtracker.com/>



Chapter 3: The digital underpinnings of VCM are still emerging

The energy sector must accelerate digital transformation to transform their value chains for the energy transition.

Despite their battles with data silos, energy companies have made progress with embedding analytics across their value chains. But there is more work to be done to build the digital underpinnings of VCM, especially as many companies have yet to adopt a common, centralized decision framework for value chain data. Such a framework would enable:

- Common, centralized decision framework for all relevant value chain data
- Real-time data analytics
- Integrated risk management
- Blockchain and smart contracts
- Specific value chain-related key performance indicators
- Integrated ESG key performance indicators
- Specific value chain-related key performance predictors
- Integrated ESG key performance predictors
- Automated value chain modernization platform

Value chain data platforms will help energy companies achieve a holistic view of the current state of their value chains by enabling the sharing of data across divisions and defining a shared “language” for key value chain metrics.

Value chain forecasting

The next step will be to anticipate future value chain events.

Forecasting key measures such as demand and pricing will help energy companies fulfill many of their value chain transformation objectives, especially as value chain management remains a top priority for energy executives.

The ability to forecast value chain metrics will require energy companies to build their artificial intelligence (AI) capabilities, which has the potential to be a profit driver in the immediate future.

AI is critical to operational reliability. “Without AI, system operators and utilities will only be able to make effective use of a fraction of the new data sources and processes offered by emerging digital technologies, and [they will miss out](#) on a significant proportion of the benefits on offer,” wrote analysts Vida Rozite, Jack Miller and Sungjin Oh for the International Energy Agency.

AI tools can detect unusual usage patterns, forecast outages and prepare backup solutions like batteries or other storage. This is especially important in the context of renewable energy, since solar and wind fluctuate. Disruptions to supply, when the wind doesn’t blow or the sun doesn’t shine, can be predicted using AI and compensated for.



New ways to integrate

Data silos make it challenging for companies to undergo value chain transformation. Even so, there is room for improvement in the way in which data is shared between partners in a value chain. In many cases, this still relies on error-prone manual processes.

A group of major oil companies, traders and trade finance providers set up a pioneering project to address this. VAKT is a blockchain-based platform that aims to replace manually coded documents with smart contracts.

When a trade is executed, any discrepancies in the information held by the buyer and seller are automatically detected, [VAKT says](#), “thereby avoiding potentially costly errors down the processing chain.”

The first physical oil trade was executed on the platform between oil traders Guvnor Group and TotalEnergies Trading. Developers expect that the digitalization of commodities processes after trading could [reduce costs by 40 percent](#).

But the VAKT example also shows the need for organizational innovation, as well as new technologies. Building a platform to execute trades required cooperation between multiple parties, including competitors who nevertheless have a shared interest in reducing trading costs. This might provide inspiration for companies digitalizing their own value chains.

Digital innovation across the value chain

Just as VCM requires data to cross organizational and divisional boundaries, the digital innovation that underpins it must not be confined to silos.

As Phillips 66 CEO Mark Lashier explained in a recent investor day, “Our value chain optimization organization is maximizing value across this system, this integrated system, and they do that by really sharpening our focus on general interest decision-making. I think this provides a really good example of how an integrated system supports market capture and utilization and maximizes value.”

As they build the technology infrastructure for VCM, energy companies will need to balance the need for digital capabilities to be available across the value chain against the risk that “digital” becomes just another silo.

Most of all, they will need to commit to innovation—even if it exposes them to risk. “Energy companies have lots of risks to consider and it sometimes makes them risk averse,” says Tabita. “But they can’t shy away from digital and innovation risk too. They need to accelerate new technology adoption to solve some of these VCM challenges.”

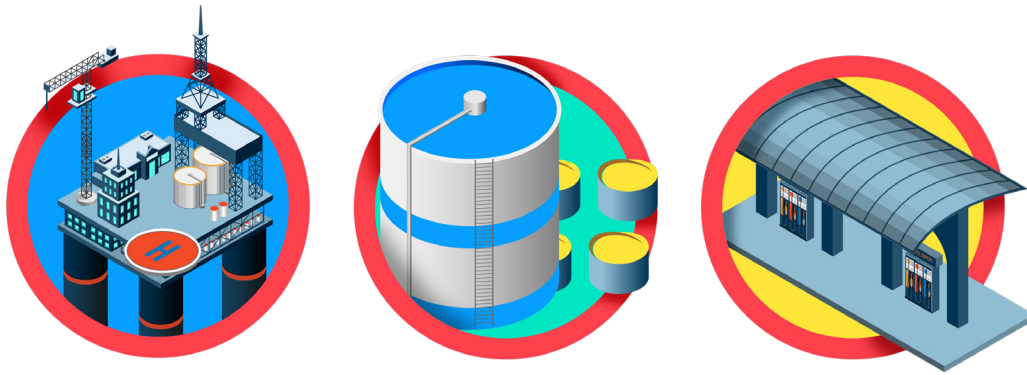
Conclusion: Three steps to VCM success

Every sector has its challenges, but the energy industry is experiencing perhaps the greatest challenge in its history, as it transforms for the energy transition.

Striking a balance between traditional operations and new green energy ventures, while embracing a more consumer-centric approach, is hugely complicated. Value chain modernization can help smooth the transition, preventing missed opportunities and surfacing hidden value.

Although VCM is not solely a digital initiative, it is hard to do without a digital platform designed to support it. Not only will this enable greater efficiency, but it can also reduce working capital and operating costs. It will also allow energy companies to focus more directly on performance, control and simplification.

Considering the three points below can help those energy companies evaluating their position in this uncertain future to find a pathway to follow.



1. Break down data silos

Data stands out as one of the most valuable assets an energy company has. However, understanding the value of breaking data silos to release hidden value can be one of the hardest challenges of VCM. Using technology to bridge silos, allowing unified decision-making and revealing hidden value should be the goal of any successful VCM transformation.

Energy companies need to focus on breaking down silos between businesses and functions to create seamless information flows and, in turn, boundaries between organizational silos should also disappear. When the right individuals have access to the right data at the right moment, it leads to more informed and intelligent business choices. Seamless data flows let divisions communicate better and act for the good of the wider company rather than purely in their own interest.

For example, an energy company could make decisions upstream regarding raw materials or energy production, which would have an impact further down the value chain, affecting the available profit margins for sales or services for customers. Energy companies need to speed up their digital transformations too, as successful VCM is always data-led.

2. Create the incentives for sharing

VCM typically involves common approaches around technology, core capabilities and incentives. Done well, it creates a networked business where everyone is incentivized to spot and seize value opportunities for the good of the wider organization.

Clarifying key decision-makers in the VCM process and how they are being incentivized, rewarded and supported is key to its long-term success. By aligning metrics, rewards programs and learning and development programs into a more value chain-driven approach, energy companies can ensure that VCM considerations are being factored into everyday decision-making.

Energy companies should, however, take care not to allow VCM work process changes to supersede a data-led approach. VCM can be executed by influential leaders and big personalities, but if it is not supported by strong digital and data-driven foundations, it will not be sustainable.

3. Clarify the commercial benefits of VCM

The energy transition means opportunities are emerging across the energy industry to commercialize new businesses. While energy companies can see such opportunities, they continue to find them hard to scale and make profitable, with some now retrenching back into legacy businesses, as investor pressures grow.

The priority should be to create a strong and agile value chain that can easily pivot to capture new opportunities.

Digital strategies should encompass a wider range of technologies that can build on data insights to create new optimizations and revenue streams. Energy companies should be tracking and evaluating the performance of their value chain using not only robust performance indicators but also performance predictors, which both measure VCM benefits and prepare them for the changes ahead.

With a more resilient and value-driven business, energy companies can then employ their industry networks to fully commercialize the energy transition.



Related reading

- [How a Major Energy Company is Realizing Its Billion-dollar Aspiration Value](#)
- [Connecting the Oil and Gas Data Pipeline](#)
- [How Companies Are Achieving Their Sustainability Goals](#)



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