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Minimize carbon, maximize profit

The way forward for energy and resources companies

The urgency to reduce greenhouse gases (GHG) has never been so intense. As a

result, shareholders, institutional investors, and regulators are increasingly holding corporations accountable for decarbonizing their businesses. Yet organizations are being pressured into this transition without sufficient clarity around the impact on profitability or the capabilities needed to bring about the change. While oil and gas (O&G) companies and related energy and resources (E&R) enterprises are navigating their way through the energy transition, a fundamental question remains:

How can organizations achieve continued profitability and lower carbon at the same time?

How are organizations responding? Many are indeed working to shift their carbon footprint¹. They are reducing capital expenditures associated with carbon-producing activities; investing in renewable energy projects; and prioritizing carbon-reduction in mergers, acquisitions, and divestitures. They are also investing in new capabilities to measure, manage, and ultimately mitigate their carbon footprint. Yet the latter efforts are primarily motivated by impending regulatory actions, such as the US Securities and Exchange Commission (SEC) reporting requirements², and tend to remain largely disconnected from the core business. This may result in a lack of actionable insights required for profitable carbon management.

What do enterprise leaders and day-to-day decision-makers need? They need a clear view of carbon-related trade-offs, particularly regarding how the cost of carbon will affect margin across each segment of the end-to-end value chain. With that transparency, management can build ways of meeting compulsory or voluntary carbon-reduction commitments into the operating model. In addition, stewardship of the environment can and should include enhancing the value chain, enabling the organization to thrive during the transition. These new capabilities are urgently needed and may generate competitive advantage for those who act promptly.

This publication focuses on ways of developing carbon management capabilities needed to maintain profitable growth. While we focus primarily on the O&G sector, many organizations with a significant carbon footprint could also benefit.

A greener tomorrow: Unlocking the possible today

Most O&G organizations are already on the decarbonization journey, but are they directing their investments and efforts effectively? For the foreseeable future, their core business will remain focused on unearthing, processing, and distributing hydrocarbons to supply the world's energy demands. Diminishing the environmental impact of these activities may take time but should begin with transparency, accountability, and active management—characteristics that should be built into capabilities for measuring and monitoring the carbon that the enterprise is creating.

It's time to move toward the possible. As the low-carbon transition evolves, choices about mitigation will likely remain front and center. Abatement through the reduction of carbon-based activities will be crucial and likely will become a regulatory obligation, as already has happened in some regimes. Carbon capture may play a significant role, and we expect increasing innovation in this space. Many O&G companies have also started to manage their carbon footprints through investments in large carbon-offset programs, such as renewable energy conversions, equipment improvements, forestry conservation, and landfill methane management.

Tough to preserve profitability and shareholder value?

Originating and monetizing these offsets can support carbon footprint reduction while providing a vehicle for valuing the impact of carbon, given that offsets have become actively traded commodities in both compliance-based and voluntary markets. The rapid growth in the voluntary carbon-offset market helps organizations accelerate emissions reduction and understand the financial impact of carbon on their business. The more these markets mature, and as carbon policy at the state, national, and international levels evolves, the better companies may become at evaluating carbon costs and the choices they face in preserving profitability and shareholder value.

What are O&G companies doing differently? At O&G companies, we have seen a long history of value chain optimization (VCO) capabilities focused on making trade-off decisions to decrease risk and increase enterprise margin. These occur through revenue enhancement efforts in blending, processing, refining, distribution, and marketing and cost-reduction programs targeting working-capital discipline, improved efficiency, and lower operating expenses. As companies continue to prioritize carbon-reduction as part of their environmental, social, and governance (ESG) commitments, simply measuring and reporting their carbon footprint will not preserve profitability during the transition. Developing capabilities that account for a broader range of carbon-related factors—and an explicit cost of carbon—should provide guidance on daily decision-making, near-term transition decisions, and longer-term strategies.

A proactive approach to tackling challenges

No problem is unsolvable. Given the importance of incorporating carbon-related factors into operational, commercial, and strategic decisions, let's consider four challenges and discuss how we may address them:

- 1. Why big data matters: As we've looked across industries, it appears that O&G has struggled to keep pace with the digital revolution. This tends to hamper emissions aggregation. Fortunately, data now used to manage operations across the value chain—such as controls information, flow assurance, and production accounting data—can serve as building blocks for the needed transparency. The big data challenge will be to standardize, centralize, and account for the enterprise's carbon footprint in real time across Scope 1 and 2 emissions (those created by running the business) as well as Scope 3 emissions (those created by consuming the hydrocarbons). Centralizing this data for use in future requirements, such as carbon trading, net-zero contracting, and abatement monitoring activities, will be essential. Recognizing that the quality of carbon data will need to mature over time, a view of both enterprise-level and business unit-level data is foundational to decisions to abate emissions and commercialize carbon management.
- 2. The indispensable collaboration: Carbon-reduction is an industry-wide effort requiring unprecedented collaboration among companies and individual organizations. Yet the O&G industry tends to operate in silos defined by assets, regions, or business segments; an issue exacerbated when acquisitions have not been fully integrated. Over time, silos have undermined value chain optimization through lack of data, process, and business integration. This can make it difficult, at best, for leaders to consider decisions involving trade-offs. It clouds the picture when they face questions such as: In which new technologies or renewable sources of energy should we invest? Should we reduce our long emission position by buying carbon-offsets and covering our obligations through an exchange? Should we invest more in carbon-offset programs?

- 3. Keeping pace with evolving markets and regulatory updates: Regulators are standardizing the measurement of carbon, using the GHG Protocol Corporate Standard³, Sustainability Accounting Standards Board (SASB)⁴ standards, and Task Force on Climate-related Financial Disclosure (TCFD)⁵ standards. In addition, markets are evolving without standardization to require and incentivize carbon reductions, such as the Low Carbon Fuel Standard (LCFS) and cap-and-trade programs across multiple states and countries. Administering these numerous evolving measurements will continue to strain organizations. However, developing measures to drive commercial insights that incorporate carbon is as urgent as addressing regulatory reporting needs. When developed together, these capabilities can enable companies to support internal and external needs with one solution.
- 4. The new green mindset: The O&G industry has rarely before faced as much pressure, in the form of investor, regulatory, and other stakeholder demands, to act in ways that may undercut its profitability. This realization is evidenced by hydrocarbon companies' voluntary public commitments to achieve a net-zero carbon footprint over defined timeframes. Akin to the existing focus on safety across the industry, employees will also need to be accountable for carbon reductions. The industry could leverage incentives to drive behaviors, but ultimately new mindsets, approaches, and skills will be required—an indication that additional training and change management initiatives may be needed.

This much is clear: The need to manage carbon is here to stay and integration of carbon intensity into the modeling—and operations—of the business should rapidly mature. Given the variety of assets, data, and supporting systems, this will likely be challenging. Senior leaders need the proper carbon management tools and resources if they are to gauge the organization's true carbon footprint, make sound investment decisions, and operationalize carbon management.





Deloitte survey explores decarbonization initiatives

In 2021, Deloitte surveyed 140 US executives to uncover costs, risks, opportunities, and reporting disclosures related to their organizations' decarbonization goals, plans, and strategies⁶.

The survey focused on financial executives in industries facing an intense need to manage carbon:

⑦ 28.6%

Power and utilities



Oil, gas, and chemicals (OG&C)

The findings include:

50%

More than half of respondents noted that the lack of clear and consistent ESG reporting guidelines is their greatest challenge. Yet carbon is just one factor in ESG reporting and awaiting further guidance can put an organization at a disadvantage.

Among OG&C companies:

17<u>%</u>

Only 17% of respondents see money spent on decarbonization as a profitable investment. However, senior leaders are responsible for optimizing profitability by managing the levers at hand in the prevailing business, social, and regulatory environment.

78% state their organization has a low-carbon strategy **36%** 36 percent highlight hydrocarbon cash flow and returns as their biggest trade-off

Notably, organizations with financial executives engaged in decarbonization initiatives (as opposed to those lacking such engagement) tend to be developing new cash flow equations. These equations include factors such as diverting growth capital from carbon-heavy resources, assets, and product lines—and divesting in those areas—as well as exploring partnerships to share strategies and capital and to monetize tax benefits. 82% 82 percent consider decarbonization as a cost.

Specifically, among the O&G supermajors, the net-zero carbon road maps announced for the next 30 years offer a strategic bifurcation between the United States and European majors that hedges both the risk posed by the rapidly growing renewables market and a reduced appetite for investment in traditional O&G assets.

35.7%

Manufacturing

Operationalizing carbon management

How sustainability and profitability can coexist

Why chart the green route your way? As organizations mature their abatement programs through a mix of emissions reduction efforts, insetting, offsetting, and the use of voluntary markets, they will need to rapidly mature how they measure performance across assets, business units, geographies, and ultimately the enterprise. Going forward, carbon-reduction goals will need to live side-by-side with profitability objectives, effectively redefining what it means to optimize a company's value chain.

That's an ambitious green agenda. But stewarding this mix of trade-offs across the enterprise can be complex, requiring nuanced decision-making at each level of the organization across multiple time horizons. While near-term factoring of carbon into decisions could require significant input from the operators closest to the source of emissions, mid- and long-term enterprise modeling may drive choices that conflict with the asset-specific decision profile. An enterprise profit and loss statement (P&L) that fully factors in the current and future forecasted impact of carbon is needed to properly prioritize and assess mergers and acquisitions (M&A), divestiture, capital expenditure (CapEx), and operating expenses (OpEx) investment decisions.

What's more? Central ownership of this responsibility should work collaboratively with business leaders to determine the decision profile that achieves the desired carbon abatement goals and margin optimization while possessing the authority to determine a path forward when these competing priorities conflict, as they most likely will. When fully functioning, this central ownership should embrace the influence or active participation of stakeholders across the enterprise, including corporate strategy; business development; trading; finance; commercial; risk management; ESG; and health, safety, and environment (HSE) stakeholders.

To balance carbon-reduction commitments against

profitability, the enterprise will need to incorporate a price of carbon into long-term planning cycles, annual budgeting processes, near-term operational planning, and real-time decision-making. In this context, applying traditional financial planning and analysis (FP&A) processes to carbon management enables accounting for carbon costs at the enterprise and business unit level, resulting in a comparison of actuals to plan on an ongoing basis. FP&A can also help prioritize and identify ways to reduce total carbon spend, much as it does with traditional spend analysis, using new metrics for both profitability and carbon-reduction objectives.

What does it take to manage carbon profitably, reliably, and safely? Operational and commercial decision-making will require more sophistication and agility than FP&A, yet those with historical practices for optimizing their value chains could parlay those capabilities to realize this ambition. Significant cross-disciplinary

modeling is required to manage carbon profitably, reliably, and safely. The volatility of both existing commodity markets and carbon pricing will demand rapid response across time horizons, so legacy VCO techniques will need to be tailored for increasingly broad, longrange views. With this enhanced modeling ability, companies might not be surprised by variances from plan or the impact of carbon on profitability. Instead, they may have insights that enable rapid responses that optimize outcomes.

Once carbon is incorporated across various forms of analysis used to plan and operate the business, companies will need to reassess the value chain and reconsider which activities are or aren't producing sufficient margin as abatement efforts are undertaken. Once priorities are identified and implemented, this same analysis can be used to measure, report, and ultimately commercialize carbon. Value chain optimization will need to mature in ways that simultaneously maximize margin and minimize carbon throughout the transition, and management will need to invest in resources to bring about that maturation.

In the process of operationalizing carbon management, leaders will need to address questions like:

- How should your organization value carbon? Various methods of attributing a cost of carbon exist and others will emerge. Several companies are deciding on an internal carbon price to fund enterprise-level abatement investments while others are adopting market-based regional pricing as determined across various regulatory regimes. These are being used as part of a transfer-pricing mechanism or internal "carbon tax" imposed on the business. Voluntary and compliance markets also provide a basis for the cost of carbon as does any investment spend on offsets and insets.
- How can management incorporate carbon considerations into daily operational decision-making? Truly operationalizing carbon management—and optimizing the value chain—means empowering businesses with the data and insights needed to understand and fulfill their roles in reducing carbon. Again, there are existing parallels in the sense that the businesses now work to optimize the value chain in their current activities (see sidebar "Optimizing your enterprise value chain").
- How will companies manage their enterprise-level carbon positions? Managing the enterprise carbon position may take some time, but with maturity, a carbon bank or carbon clearinghouse can be established. O&G companies are naturally long carbon and are engaged in investments to reduce carbon or go short through trading and offset markets in order to achieve a net-zero position. With federated contributions to this position occurring every day, a continuous picture of the long and short carbon positions will be needed to fully factor in the costs and benefits of the net position while providing transparency to each segment of the organization (as explained more in the next section).

A carbon bank to accelerate your transition

To go further and faster, you may need a carbon bank. The concept of a carbon bank as a clearinghouse for long and short positions is essential for an effective enterprise carbon management strategy. This is not unlike the role the trading group plays when managing the position in other commodities. Active management is required to provide an enterprise view in order to achieve intended carbon-reduction and flow assurance, or value optimization outcomes; and to avoid unintended exposures, and pass back the implications of decisions to the rightful business segment.

Varying levels of carbon footprint will naturally exist across different business units. Similarly, opportunities to generate carbon-offsets will be diverse across the organization. At the enterprise level, carbon-intensive activities should be balanced against investments made to mitigate carbon. Given that many organizations have centralized the carbon-reduction responsibility, it is more important to be able to pass back the benefits of those investments in some meaningful way. In this way, nuanced global regulatory requirements, enterprise voluntary commitments, and commercial ambitions become as transparent as needed to achieve carbon neutrality in an orchestrated manner.

As part of this, we anticipate the need for technology support to effectively serve the position management system, much like today's commodity trading and risk management systems. Like these systems, a carbon position tracking capability and clearinghouse mechanism can enable management in the following ways:

- Understand which businesses within the organization are long and short carbon and to what extent
- Assign a commensurate internal "carbon tax" associated with businesses that are long carbon
- Motivate businesses to internally buy offsets (when they are long on carbon) and to sell offsets (when they are short)
- Incentivize the creation of offsets to help reduce the "tax" of being long carbon and/or motivate the reduction of carbon-intensive activities
- Gauge whether the enterprise as a whole should monetize its offsets or use them to achieve voluntary abatement goals
- Incorporate carbon positions into forecasting models so management can see how much carbon and offsets the various businesses will create
- Enable modeling of carbon exposure to events that may impact the value of a carbon-offset, for example, a weather event affecting a nature-based offset (such as a forestry project)
- Bring carbon considerations into investment decisions, such as CapEx, M&A, and divestiture initiatives, as well as into operating decisions

This capability can help generate a P&L statement for carbon. Carbon costs and credits, expressed in monetary values, may likely begin to roll up to a consolidated P&L. As with other commodities, those costs and credits can then be charged to and netted out for the various businesses and the carbon-position management capability could allow organizations to reconcile those costs and credits across the enterprise.



Takeaways

Ready to seize the opportunity?

Essential, expensive, and evolving? Seizing this opportunity requires investment in carbon management, not as a sideline but as an integrated financial and commercial optimization initiative. Insights produced by new capabilities can engender the vigorous action needed to optimize carbon decisions, whether they are compulsory, voluntary, or commercially driven. Early enablement will naturally be imperfect; but over time, the operating levers at hand should become clearer, enabling trade-offs based on enterprise-level insights.

The following steps could further assist senior leaders in navigating the transition at this stage:

- Embrace the data you have and enrich it over time: As noted, relative to those of some other major industries, digital solutions for O&G companies tend to be underdeveloped, especially in managing core operational information. In addition to reinforcing silos, this could limit management's ability to gain a panoramic view of operational, financial planning, and commercial decisions. Avoid trying to perfect your data and analytics and start to leverage what is available today. Over time, further digitalization can enable the enterprise to more fully exploit big data. When this happens, you could potentially realize the benefits of enhanced planning, decision-making, and reporting in optimizing the enterprise value chain.
- Broaden your strategy and think bigger: Uncertainty attends strategic decision-making, and the strategic management of carbon is riddled with it. Those who can plan for the most material uncertainties may likely fare best. This may require O&G companies to think boldly, go beyond assuring compliance with compulsory requirements, and treat carbon management as the essential industry practice it has become. Companies that truly integrate carbon management into their decision-making could open up numerous new possibilities. Those that fail to may diminish their strategic choices, slowly degrading internal cash flow as carbon's impact grows.
- Build for the future as you address today's needs: Regulatory regimes across the globe are advancing their expectations on the measurement, management, and mitigation of carbon. Investors are pressuring companies to act. These expectations should not be ignored, but neither can the needs of running a profitable and growing business. Purposeful development of processes and systems to meet external requirements should also consider the internal needs of the company. Addressing both could create the insights required to support strategic decisions that internally grow the business while meeting external demands.

i

Optimizing your enterprise value chain

Industry-wide practices for VCO are often most mature in downstream O&G. Refineries have used linear programming models to review short- and mid-range decisions to increase profitability, maintain reliability, and decrease costs while maintaining HSE standards. Parameters for these models include items such as relative demand, crude slate, and product pricing.

As these modeling capabilities continue to mature, carbon can be incorporated into the optimization hierarchy. Depending on the levers at hand, the optimal production slate may differ from that calculated without factoring in the cost of managing the carbon produced. However, incorporating carbon in the modeling process will likely introduce new factors to consider.

For example, regarding transportation of crude, the following questions are among those that may arise:

- Was it transported by vessel, train, or pipeline? Is the organization managing the carbon impact of transportation by leveraging owned or purchased offsets?
- How can the cost of carbon be most realistically incorporated into the analysis?
- How might transactions differ in the future (for example, could carbon-neutral shipments with bundled offsets based on the carbon associated with the cargo be useful)?
- How will the organization measure implications like these going forward?

However, once questions like these are addressed, the organization has precedents and methodologies that could be useful in carbon management. While modeling that includes carbon should start with partial information, working to optimize forecasted margins with carbon scenarios included could generate experience and knowledge. As modeling matures, it incorporates features that dynamically adapt to changing regulatory and market conditions, such as incentives, costs, and the market value of carbon across geographies and regimes.

Let's explore your possible

You can be the catalyst for change. It's possible—faster, together. The rate of change of carbon's impact on an O&G organization's future is accelerating with no stable destination in sight. While this conceivably presents an existential threat to the industry, given the many challenges of replicating significant attributes of hydrocarbons—their abundance, versatility, energy density, and benefits to users beyond being a source of energy—a pragmatic forecast can help place them in a role in the world's economies for a long time to come. Thus, as O&G companies compete in an environment of carbon-driven considerations and costs, the winners will doubtlessly develop ways to integrate existing practices with future VCO goals.

No organization can take a backseat now. And the journey has already started for many organizations, but the difficulty of anticipating future needs is hampering progress. Those who lead despite uncertainty will likely find ways to optimize the value chain and decarbonize the industry while maintaining the flexibility needed to respond to evolving demands. These same leaders can help to shape the regulatory direction and influence investor perceptions about the future viability and role of hydrocarbons, quite possibly in a shrinking landscape.

This raises a final question: Where will your organization reside in this landscape?

> As investors and stakeholders are demanding insights into carbon management and costs, companies should avoid waiting for regulatory decisions before incorporating carbon into their models.

6/10

businesses surveyed feel increased pressure from stakeholders to disclose and address climate risks

9/10

reviewed or changed their disclosure procedures and developed plans to address climate risks⁷

So, companies feel pressure and are responding accordingly. Those that mount the fastest and most effective and sustainable responses can be expected to thrive in the long term.

Endnotes

- 1. The Imperative for Carbon Management; by the Center for Energy, Development and the Global Environment (EDGE) at Fuqua School of Business, 2022 Deloitte Development LLC, us-the-imperative-for-carbon-management (1).pdf
- Proposed rule: The Enhancement and Standardization of Climate-Related Disclosures for Investors, <u>https://www.sec.gov/rules/proposed/2022/33-11042.pdf</u>
- 3. Greenhouse Gas Protocol, https://ghgprotocol.org/corporate-standard
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- Energy Management: Paused by pandemic, but poised to prevail, Deloitte Resources 2020 Study, 2020 Deloitte Development LLC < <u>https://www2.deloitte.com/us/en/insights/industry/power-and-utilities/energy-study-of-businesses-and-residential-consumers.html</u> >

Contact us

The time to answer that question is now, and Deloitte is here to help. The goals may seem ambitious, but they are achievable. And it's time to do what it takes.

Are you interested to learn more? Contact us now.

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