

In collaboration with the World Economic Forum

oil & Gas 2030 Let there be change

For years, oil and gas companies have struggled to achieve profitability, capture investors' interest and secure public trust. Those challenges have been exacerbated recently by an abundance of supply, the growing decarbonization momentum and the structural shifts in consumer behaviors. Many companies' relevance— and even their social license to operate—are called into question.

And that was before COVID-19. The pandemic brought about a demand disruption that no one could have foreseen. It was a jolt to the energy system—a strong indication that returning to "business as usual" might be unlikely.

What is clear for many in the industry is that challenging established paradigms and looking into reinvention is essential for success. That mandate is forcing industry leaders to grapple with two fundamental questions: What should their portfolios look like? How would they win by investing in the right capabilities and ways of working?

The need to change course

Despite prices averaging above \$70 per barrel over the last 10 years, free cash flow from core operations has been insufficient to maintain shareholder returns above the cost of capital. The leverage ratio of total debt to total liquidity has more than doubled since the depths of the 2008 financial crisis, and the industry's share of the S&P 500 has been cut by more than half over the last 10 years.

Despite these warning signs, oil and gas companies still have a fundamental role in the energy future—particularly when it comes to enabling nearly a billion people to access secure, affordable and sustainable energy. But oil and gas will no longer be the undisputed energy leader, as other sources will assume dominant positions.

Transportation—a major demand sector for the oil and gas industry today—provides a clear example. Vehicles using internal combustion engines (ICEs) still enjoy an economic advantage over electric vehicles (EVs) in most geographies. In the United States, for example, today's total cost of ownership (TCO) for EVs is over 20 percent higher than it is for ICEs.¹ Even if fuel prices for ICE light vehicles rise to \$4+ per gallon (reflecting \$120/barrel oil), ICEs would still be competitive based on today's TCO.²

By 2030, however, a different outlook could emerge and EVs could have the upper hand. Due to major improvements in the cost and efficiency of batteries, the TCO for EVs will drop sharply, as shown in Figure 1. Accenture estimates that the maximum gasoline price that will allow ICEs to remain competitive in 10 years is \$1.55 per gallon. That translates into a crude price of \$20 per barrel³ in the absence of fuel tax and environmental parity. If environmental and fuel tax parity are achieved, ICEs can be competitive as long as crude sustains a maximum price of \$40 per barrel⁴

Figure 1: What it takes to compete with EVs in the 2030

Total cost of ownership (TCO) for electric vehicles (EVs) will drastically reduce by 2030, putting competitiveness of ICEs in question



Source: Accenture analysis

Note: (a) Ford Focus and Nissan Leaf with 12-year life and 10,000 annual miles; (b) production costs held constant for ICEs; (c) carbon tax of \$50/ton; (d) road tax equalized; (e) EV subsidies excluded from analysis; (f) assumed 10% refining cost cuts

In addition to demand headwinds blowing from the EV sector and others, the oil and gas industry is facing a historical flattening of its supply curve. The result is a structurally challenged margin outlook. Further complicating matters is the fact that these supply and demand challenges are occurring in an environment characterized by changing societal values, technologies and ways of working. The combinatorial effect of such multi-faceted disruption demands calls for oil and gas companies to assess the changing course.

Where to play in the energy ecosystem of 2030+

Oil and gas companies, as well as their supply chain partners, face a crucial choice about future portfolio strategies. In a decarbonizing economy, and in an industry where profit pools are shifting downstream away from fossil fuels⁵ as shown in Figure 2, incumbents must decide what to offload, where to diversify, what to optimize and which new market opportunities to target.

Figure 2: How industry pools have shifted





Source: Accenture analysis

Broadly, three different portfolio strategies are emerging, each with a different focus on where to play.



Where to play? Market shifts will give rise to 3 broad portfolio strategies



For more on the portfolio strategies oil and gas companies should consider in the decarbonized future, see Accenture's <u>Decarbonizing Energy from A to Zero</u> report.

How to win in the next decade

Once they decide the role they want to play in the future energy ecosystem, companies need to consider how they can maximize their chances of success. Affirming their relevance will require new behaviors and new mindsets. Long-standing orthodoxies in five areas must be set aside to make room for the innovations that will power the energy future.

Capital allocation	Operations	Offerings				
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& Industry collaboration						
Ways of working						

How to win? Companies will need to invest in 5 key capabilities

The way oil and gas companies move forward to win in these five areas will depend on their unique circumstances and the portfolio strategy they choose to pursue.

Capital allocation

In a future where price fluctuations continue, margins are low and external capital is hard to attract, a more granular and dynamic capital allocation becomes a must-have. It becomes even more important when factoring in the cost of emissions, which are likely to impact the relative positioning of assets in the supply curve as shown in Figure 3.⁷

We have seen the effect of rapid shifts in asset economics on the industry before, most recently in the areas of shale and deepwater oil. Between 2014 and 2019, breakeven costs of North American shale and deepwater declined by over 30 percent, more than three times the industry median.⁸ This shifted asset economics for oil producers, changed oil geopolitics, suppressed oil prices and altered crude differentials for refiners.

Figure 3: How asset economics will shift





Source: Accenture analysis based on multiple sources including Rystad Energy UCube, Dec 2020 Note: (a) Costs other than carbon tax held constant; (b) Carbon tax set to \$50/ton.

While past shifts in asset economics were driven by technology advancements, the next wave will be driven by higher carbon pricing factored into project-level economics.

Looking forward, an oil and gas company's portfolio will no longer be solely determined by breakeven economics, but also by its environmental impact from Scope 1 and 2 emissions. But not all oil and gas reserves are equal in terms of emissions intensity. For example, Western Canadian Select Oil has related lifecycle emissions four to five times greater than that of Arabian Crude Oil, in addition to having a breakeven price more than twice as high.⁹ Having an understanding of emissions, along with the drivers of those emissions and the operator's ability to reduce them, is evolving to be another branch—and competitive advantage—of portfolio strategy.

But the need for better capital allocation goes beyond asset class and traditional portfolio allocation. In fact, even within profitable upstream assets there are wells which are not in the money. In some cases, the asset managers have a good understanding of the relative economics of each well. In most cases, this knowledge is incomplete.

Similar lack of granular understanding can also be seen further downstream in the industry. For example, it is common for storage and logistics assets profitability to be absent during value chain investment decisions. Moreover, we have seen refineries with out-of-date understanding of the individual process unit economics, and even without actionable mass and energy balances. All of this makes the identification and prioritization of capital investment very cumbersome. Furthermore, capital allocation processes fail to consider this level of granular insights, making allocations sub-optimal and on long cycles.

Let there be change

Out with the old paradigm

Success in the industry is determined by a company's oil and gas volumes and market share.

In with the new

Success is predicated by a company's ability to maximize returns from every molecule and electron to dynamically shift its portfolio to the most competitive assets. To stay relevant in a world of excess, oil and gas companies need ensure their portfolio decisions are based on both market intelligence (such as demand signals and competitive positioning) and granular margin insights. This dual view will enable companies to make more informed decisions about which assets to start, stop, maintain as-is, or invest in.

Improving capital allocation will also require a fundamental change in how the industry views capital intensity. This may sound as counterintuitive to many executives as capital intensity is a hallmark of growth for the industry. Other industries have been able to migrate their models to great success. One such example is the hotel industry, which successfully migrated from a 'full-ownership' model into a 'management-only' operations when the industry was facing mounting debt levels in the 1990s. Recognizing that their core value was in hospitality services, they began decoupling property ownership from hotel management by selling off properties, spinning off property arms or franchising their brand. As a result, return on capital employed (ROCE) improved dramatically, with some brands experiencing improvements of up to 5x.¹⁰ For oil and gas, moving to an asset-lighter model would allow upstream and downstream operators to focus exclusively on operational excellence.

The focus and potential benefits of a flexible capital allocation capability will differ from company to company, depending on the portfolio strategy each opts to pursue.

How does this look across portfolio strategies?

The focus and potential benefits of a flexible capital allocation capability will differ from company to company, depending on the portfolio strategy each opts to pursue.



Regardless of portfolio strategy, there are steps all oil and gas companies can take:

- Sharpen proprietary views on profit pool evolutions to decide where to invest—and where to divest.
- Increase level of granularity and flexibility when making long-term and short-term capital allocation decisions.
- Find new ways of reducing capital intensity such as considering new ownership models for assets or sharing capital investment with other stakeholders.

Operations

To remain competitive, the industry will have to find ways to significantly increase its operational effectiveness and efficiency. A key lever in achieving this is technology.

However, technology adoption in the oil and gas industry has traditionally been reactive. For example, an enterprise resource planning (ERP) system upgrade would typically happen when the operating model changed or when the legacy platform was nearing the end of its life. Similarly, a decision to move to cloud would typically be tied to a major cost reduction initiative.

Let there be change

Out with the old paradigm

Engineering is the primary way to improve operations, and only engineers can get it done. In fact, any technology upgrade is a cumbersome process that rarely generates real value.

In with the new

Cross functional teams work together to harness the value of digital technologies. They are part of our DNA and evolve as we do to make us ever more agile, responsive and competitive.

Today's digital environment requires a much more dynamic approach. Multiple technologies—cloud, artificial intelligence, data analytics and more—are simultaneously accelerating, reinforcing each other's capabilities, and creating exponential growth in transformational potential. Energy companies that understand this combinatorial effect of technology and operate like "digital natives" are reaping the value of innovating at scale.

Accenture's research shows that the top 10 percent of companies that integrate technology as a core part of their operating model also grow at twice the rate of their peers.¹¹

However, becoming digital-native is not something that can happen overnight. The key is to take an outcome-first, rather than a data-first, approach. That is, companies should not start by looking for potential use cases based on the data they already have. Rather, they need to start with the specific business outcomes they wish to achieve, then prioritize their business cases and identify a range of possible solutions before creating the data foundation and technology backbone. Under this approach, development is accelerated by starting small and using a minimum viable product (MVP) to prove the value before scaling up quickly.



How does this look across portfolio strategies?

The focus and potential benefits of a flexible capital allocation capability will differ from company to company, depending on the portfolio strategy each opts to pursue.



Regardless of portfolio strategy, there are steps all oil and gas companies can take to strengthen their digital capabilities:

- Take an outcome-led approach, driven by business needs, to technology innovation to help shorten return cycles on investment.
- Accelerate the Human + Machine journey. Identify processes that can be augmented with digital tools, supported by a culture that embraces change and innovation. Prepare the workforce for this new era in operations—as discussed later in "ways of working."
- Strive to increase autonomation of asset operations, challenging traditional ways of working rather than simply digitalizing to transform operations and the cost structure.

For more on starting a journey towards digital-first energy operations, read Accenture's recommendations on <u>cloud</u> and <u>data</u>.

Offerings

As the energy ecosystem diversifies and decarbonization grows in relevance, users of energy will rethink what they consume and how they do it. For example, a vessel operator will not only be thinking about from whom to buy low sulfur bunker. Instead, they will be looking for partners that can help them assess different fuel alternatives, how to optimize their energy consumption, reduce their carbon footprint and potentially finance the investments required.

Let there be change

Out with the old paradigm

Commercial groups' primary role is to ensure the disposition of hydrocarbons, with some room for commercial optimization.

In with the new

Commercial groups are a primary source of value creation. To do so they need to uncover and serve customer needs that go beyond hydrocarbons to include other sources of energy, ESG considerations and other services.

Incumbent oil companies are well placed to use their current strengths to make themselves a part of the solution.

The same will happen across industries in what may become a boon for the oil and gas players able to evolve from a molecule-first model to a customer-first one. To illustrate the magnitude of the opportunity, carbon emissions from the nine largest energy-consuming industries, are forecasted to increase by 70 percent through 2050, reaching 34.7 gigatons globally as seen in Figure 4. This level of emissions will become unsustainable for many energy-dependent sectors, both financially and environmentally.

Figure 4: What carbon emissions look like in 2050

O&G Companies can play a key role in helping energy intensive customers manage their ESG priorities while reducing cost

	Industry	Energy intensity (% cost)	Emi	50)	
_	금을 Light transport	~20-40%	3.6 Gt	+61%	5.8 Gt
Transportatior	Heavy road	~30-40%	2.5 Gt	+84%	4.6 Gt
	Aviation	~20-25%		+80%	1.8 Gt
	员 Shipping	~50-60%	œ	+89%	(1.7) Gt
Industrials	Steel	~20-40%	2.3 Gt	+43%	3.3 Gt
	Cement	~25-30%	2.2 Gt	+5%	2.3 Gt
	Chemicals	~80-90%	(1.5 Gt	+31%	2.0 Gt
Commercial	🛒 Retail	~5-10%	3.8 Gt	+119%	8.3 Gt
	Power - gas	~70-80%	2.9 Gt	+72%	4.9 Gt

Sources: (1) Accenture 2050 Carbon Emissions model; (2) Accenture Analysis based on industry cost structures

These industries will move towards greater decarbonization, with or without the help of the oil and gas industry. However, incumbent oil companies are well placed to use their current strengths to make themselves a part of the solution. To do so, they will need to develop the ability to gain a deep understanding of their customer needs, and break from the hydrocarbon-centered mindset. In many cases, they will also need the ability to work across sectors, such as with renewable-power developers, financial institutions, etc.

How does this look across portfolio strategies?

The focus and potential benefits of a flexible capital allocation capability will differ from company to company, depending on the portfolio strategy each opts to pursue.



Regardless of portfolio strategy, there are steps all oil and gas companies can take to strengthen and accelerate their customer-centric offerings:

- Build an intimate understanding of the future needs and preferences of your different customers. Don't stop at the 'type of fuel' level. Instead, segment your customer base smartly.
- Identify the capabilities you have (or can create) to uniquely meet those needs, as well as where you need to partner with players in other sectors to do so.
- Position yourself as part of the solution to the energy transition. This needs to be supported by a rebranding which builds trust with society and creates an image of a responsible company committed to ESG actions.

Industry collaboration

Rather than holding capital on balance sheets or keeping data locked in servers, oil and gas companies should consider connecting with ecosystem partners and sharing resources. Other industries, like automotive and aerospace, have embraced ecosystem collaboration to improve performance for everyone in the industry. There is no reason oil and gas should not do the same, as long as it is in strict compliance with anti-trust/ competition law guidelines.

Let there be change

Out with the old paradigm

Exclusive ownership of assets and data is necessary to compete.

In with the new

Sharing resources and data with industry partners unlocks value.

Consider the potential gains in operational efficiencies. Accenture has found there is around \$430 billion per year in the global upstream and downstream oil and gas value chain waiting to be unlocked through greater efficiency,¹² as seen in Figure 5.

Further, we estimate that approximately a third of the waste in the upstream ecosystem and 20 to 30 percent in downstream can be eliminated through industry collaboration.

Figure 5: Where industry trapped value comes from

Global O&G Industry Locked-in Value (USD bn) is mostly concentrated in Upstream activities

			Exploration	Dev	elopment	Production	N	lidstream	Refining
CAPEX	Exploration CAPEX	\$5B	Seismic collection and interpretation						
	Well CAPEX	\$50E	Incremental recov	very				• •	
				<mark>\$10B</mark> DU	JCs \$10B Idle wells			~\$4.	30B
				\$20B W	/ell overdesign	\$5B Well interventions	of trapped va		alue from s in the system
			\$5B D (e	rilling assets e.g., rigs)	\$5B Gas flaring		inefficiencies		
				\$30B D co po ec ar	rilling and ompletion ersonnel, quipment nd services				
	Facility CAPEX			\$30B Cu pa	ustomization of irts and equipment				
				\$30B Fa	acility overdesign	\$20B Midstream overca	pacity		
				<mark>\$40B</mark> Fa	acilities overcapa	city			
×	Production OPEX			\$5B PI	lanned downtime	•			\$5B Energy efficiency
				<mark>\$30B</mark> U	nplanned downti	me			
				\$15B In	nventory surpluse	S			
						\$40B Production efficie	ncy		
	Logistics OPEX					\$10B Logistics and ware	ehousin	g assets	
	SG&A OPEX					\$30B Office and admin	produc	tivity	
Va	lue chain uplift								\$40B Value chain optimization

Sources: Accenture analysis

Four collaboration models hold particular potential:

- The first focuses on reducing the cost and complexity of customization by standardizing things like well designs or product manufacturing.
- The second model focuses on integrated planning and sharing to minimize the underutilization of assets such as pipelines and logistics networks when demand fluctuations lead to surpluses or overcapacity.
- In the third collaboration model, industry players can come together to reduce the duplication of labor and increase economies of scale. Shared back-office services or drilling and completion services and equipment are examples.
- Finally, there is the collaboration model focused on knowledge management. Sharing commercially nonsensitive data and expert knowledge can improve everything from well interventions to recovery factors to unplanned downtime.

The encouraging news is that the industry is catching on to the value of collaborating with different ecosystem players. Through the World Economic Forum, for example, operators and suppliers have come together to establish resource sharing hubs in basins with a high concentration of activity. In addition to reducing their carbon footprints, participating upstream players can unlock an estimated \$50 billion in value each year.¹³

Collaboration must also happen with other sectors. For example, working closely with renewable power developers and utilities and better support the energy transition. Or, with technology specialists that can help accelerate the adoption of AI.

How does this look across portfolio strategies?

The focus and potential benefits of a flexible capital allocation capability will differ from company to company, depending on the portfolio strategy each opts to pursue.



Regardless of portfolio strategy, there are steps all oil and gas companies can take to focus their capabilities and take greater advantage of industry collaborations:

- Develop a collaboration strategy, starting with a partner-by-default mindset and identifying the areas where you want to lead the effort.
- Selectively enroll peers and vendors and form integrated teams to drive the collaboration.
- Include partnership goals on all relevant executive scorecards.

Accenture 2020 <u>Collaborate to Reinvent</u> report addressed the waste in the upstream industry. Please see our report for more collaboration recommendations.

Ways of working

Implementing the changes described earlier requires a new operating model for oil and gas. This includes rethinking the composition of the workforce and the creation of a lean, multiskilled and multigenerational pool of talent that is comfortable co-existing with smart digital automation.

Adjusting to the industry's energy transition imperatives also calls for today's workers to be reskilled. Demand for traditional petro-technical skills is already in decline, thanks to improvements in operational efficiency. The need for such skills will likely decline more rapidly in the future as overall energy demand shifts to renewables and production primarily comes from brownfield development. In fact, Accenture's analysis suggests there could be a surplus of 100,000+ petro-technical professionals by 2050, see Figure 6.¹⁴ But the knowledge and experience held by these professionals is invaluable to the industry; reskilling some of them will be an important part of the industry's story of reinvention.

Figure 6: What demand vs. supply looks like for petro-technical professionals (PTP) in 2050

O&G market trends associated with efficiency and hydrocarbon demand may lead to a surplus in PTP talent



Fewer FTEs are used to produce a barrel of oil...



...with easing global consumption, resulting in declining demand for PTPs

Sources: Accenture analysis based on (1) annual reports of 120+ firms; (2) GlobalData production data

As important as reskilling is, it will not be enough. New niche and specialized skillsets are also needed. By Accenture's estimate, the upstream oil and gas industry needs around 12,000 new data science experts. This talent is in extremely high demand globally and the industry struggles to recruit it. Today, energy companies appeal less to younger hires than other industries. In the US, for example, only 24% of the energy workforce is under 35 compared to 32% cross-industries.¹⁵

As a result, the industry faces a growing imbalance in the makeup of its workforce, particularly as experienced workers with decades of industry experience leave the workforce. Many organizations are moving to close these gaps with more adaptive workforce models. These models look to leverage, at scale, a workforce that can "learn on the go," while tapping into external worker marketplaces on demand. Creating an organization in which experience, new skillsets and the energy transition journey work in harmony also requires an overhaul of how work is constructed and executed and how talent is managed. And this cannot be exclusively an internal exercise. To make this transition a success, oil and gas companies need a structured approach anchored on a renewed purpose and brand image.

Let there be change

Out with the old paradigm

Our workers, many of whom have been with us for decades, bring vast amounts of industry knowledge and provide us a competitive advantage.

In with the new

Our workers are agile and digitally savvy, infusing our operations with a dynamic culture that is constantly evolving.

Anchoring any transition, of course, is leadership. Leaders of oil and gas companies today are spearheading an industry which is at a true inflection point. Providing a sense of purpose, driving positive change and creating an organizational culture excited by this new horizon will be the key to success.

No company will be able to accomplish this at scale on their own. At least not on a timely fashion. To increase the odds of success, companies need to declutter, automate and partner. By declutter, we mean a rethinking of what really is important and a laser focus on it. By automate, we mean the continuous standardization, simplification and enhancement of work processes, enabled by technology.

By partner, we are referring to two different things. First, is the entering into long-term agreements with the vendors able to do some of your non-core activities better. Partnering used to be predicated on a labor cost arbitrage. While the arbitrage still exists, the most compelling reason to partnering is the ability of the vendor to improve and automate the work processes significantly faster than any company can do on their own. This way, rather than dedicating energy to the futile task of being best in class/lowest cost on non-core areas, oil and gas companies can focus on what really matters to them, while saving precious cash in the process.

Second, is finding the right ecosystem partners to bring in some of the new capabilities required that are hard to build or acquire. This is particularly the case for skills like advance analytics, where top talent may prefer to go to technology companies. These technology companies may be good partners to the oil and gas industry.

How does this look across portfolio strategies?

The focus and potential benefits of a flexible capital allocation capability will differ from company to company, depending on the portfolio strategy each opts to pursue.



Regardless of portfolio strategy, there are steps all oil and gas companies can take to introduce smarter, more valuable ways of working:

- Rethink the work and the workforce. Deconstruct existing roles and processes into tasks, challenging entrenched ideas about the what, how, when and where of work. Ensure work adds value and is aligned with company strategy.
- Redefine the employee experience. Identify career pathways to manage both new and existing talent. Create hyper-personalized talent-development experiences that combine informal, formal and in-workplace learning methods.
- Reimagine the enablers of work. Set an organizational and leadership culture that provides a sense of purpose and drives positive change. Shift to a dynamic approach that looks to build, buy, borrow or automate new roles.

For more on Accenture's recommendations on how the energy workforce needs to change, please see our report <u>Reinventing the Energy Workforce</u>.

How to get started?

The amount of change outlined in the last few pages will take years to be accomplished and can certainly feel overwhelming to industry executives and participants. This is particularly the case after a rough 2020 where virtually all oil and gas companies had to make many difficult choices.

Below Figure 7 shows a journey blueprint that could be of help in turbocharging your company's journey over the next 12-18 months. Needless to say, each journey is unique. Yet, in our experience, having an anchor can help executive teams coalesce faster on a path forward.

Figure 7: How companies can get started

Each journey is unique, however, having a journey blueprint can help executive teams coalesce faster on a path forward



Turbocharge Your Company's Transformation Journey

Set a bold North Star

Get on the front foot and reposition your company as a responsible member of society to improve trust between the industry, society, investors and employees. This begins with a change in vision and culture. Look to take control and lead the world's ESG action, accepting it's on you to shape the industry's role in a decarbonized future.

Culture will be a big part of the change. Consider issuing a bold CEO manifesto setting out your company's purpose in a post-COVID world. Ensure your organization can attract a new generation of purpose-driven graduates—whether through accelerated career paths for promising young talent or being a sought-after alma mater for key skills in the future economy.

Declutter your portfolio and organization

Develop your own view of profit pools and decide where to invest—and where to divest—to capture future value. Make sure to appropriately take into account optionality and uncertainty.

From an organizational standpoint, develop a crystal-clear view of the differentiated capabilities you need to have in house. Identify those you are going to build or buy, and those where you build a partner ecosystem. For the rest, find the right partner to take over those activities. This will result in improved focus, lower costs and increased resilience.

Reset expectations for collaboration with peers and vendors

It will take time for collaboration models to evolve, but they never will if they are stopped at every turn by your employees. Give the clear signal that collaboration is the default for all nonbusiness-critical activities and for several business-critical ones. Set the tone and celebrate the breaking of the mold.



Turbocharge customer-centricity

Molecule-first organizations do not become customer-first overnight. Therefore, the more critical to set the tone from the tone, with clear expectations of the shift needed. Learning from other industries can be a good way to accelerate this process.

Accelerate the Human + Machine journey

Technology is a central driver of transformation—take a business-led and outcome-based approach to technology innovation that will change ways of working and shorten the return cycle on investments. Strive to create fully autonomous assets by executing targeted end-to-end initiatives and setting a culture towards change and innovation.



Conclusion

The oil and gas industry has gone through difficult times before. But the scale of challenges it now faces calls for urgent action. To remain relevant in a decarbonizing world, oil and gas players need to revisit old paradigms and define strategies for reinvention.

The challenges should not be understated, but the opportunities are clear. There are numerous routes to a sustainable and profitable future for oil and gas companies. To secure that future, **'let there be change.'**

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