

ENERGY COMPANY OF THE FUTURE

VIVEK CHIDAMBARAM,
MUQSIT ASHRAF,
MANAS SATAPATHY

 **accenture**strategy

AN **EXISTENTIAL** CRISIS FOR OIL AND GAS COMPANIES

In a world that seems irreversibly addicted to hydrocarbons, staggering changes are underway on both the demand and supply sides of the oil and gas value chain. Due to a combination of factors, **demand for two hydrocarbon supply sources—oil and coal—is expected to peak around 2030 (for oil as late as 2040)**, according to Accenture Strategy's analysis conducted as part of the World Energy Council Energy Scenarios study.¹ Concurrently, on the supply side, assets such as shale and non-hydrocarbon sources like solar and wind are increasingly eating into oil's share of the energy mix.

The result is a dramatically new paradigm that the oil and gas industry must adjust to, and quickly (Figure 1). This paradigm is characterized by fluid and stochastic versus static and deterministic markets; a focus on value creation and margins versus production and utilization; and the primacy of short-cycle investments over mega-long-cycle ones.

Figure 1: The new oil and gas industry paradigm

		Today	Future
Key Parameters	Market view	• Deterministic • Static	• Volatile • Fluid
	Industry metrics	• Production • Utilization	• Margins • Value
	Investment profile	• Large/mega • Long cycle	• Small/micro • Short cycle
Key success criteria		• Scale • Size • Recovery • Specialization	• Agility • Adaptability • Speed • Collaboration

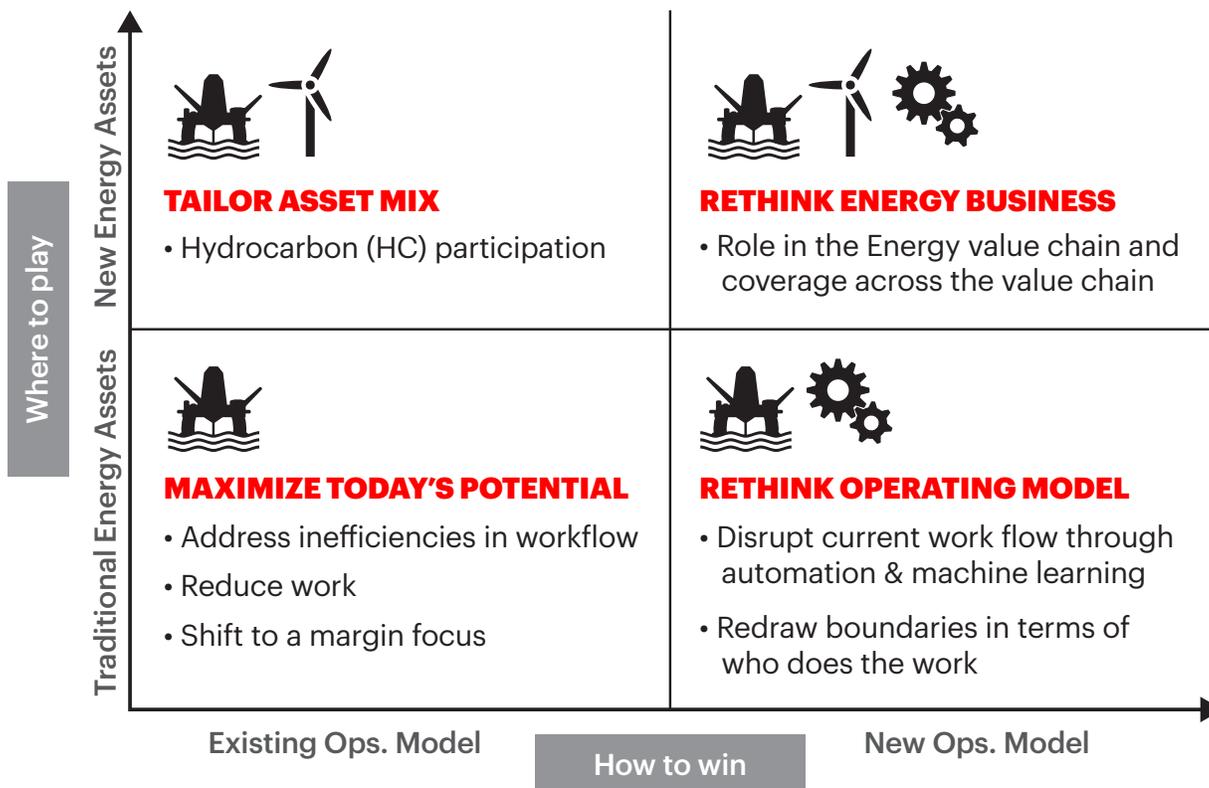
		Old	New
Upstream		• Mega projects / platform • 20–30 year planning • Maximize recovery	• Small LNG and projects • 5-10 year horizon • Time to first oil
Downstream		• Commodity, 'offtake' • Optimize for refinery slate • Long term contracts	• Customer focus • Improve refinery flexibility • Trading & optimization

To succeed in this new world, the oil and gas industry will need to be both agile and adaptable, connected and collaborative—and that will require radically different thinking along two dimensions (Figure 2): 1) where to play—the essence of their business, their role in the value chain and the value they create; and 2) how to win—the new operating models they will need to support their chosen portfolio. The common thread across both dimensions is digital. Digital not only opens up entirely new opportunities for oil and gas companies, but also makes possible robust new operating models that can transform how they execute and compete.

The larger effect on companies could be game changing. Accenture Strategy modeling conducted as part of the World Economic Forum research study reveals shifting from the traditional way of operating to digitally-enabled portfolios and operating models is a trillion-dollar-plus opportunity. This translates into a multibillion-dollar opportunity for most medium to large players.

To succeed in this new world, the oil and gas industry will need to be both agile and adaptable, connected and collaborative.

Figure 2: Strategic options to retool the energy business



WHERE TO PLAY: USING DIGITAL TO HELP INFORM WHAT'S POSSIBLE

As oil and gas companies consider the new roles they will play in the energy industry, their decisions will be shaped by prevailing trends—both on the supply side (abundant resources; a diversified, competitive mix of energy sources; and relatively restrained prices) and the demand side (a need to unlock demand and a shift from a commodity-centric to a consumer-centric energy market). Three considerations are especially important for oil and gas companies to keep in mind as they build their new portfolios.

Depth over breadth. In a world of abundance and intense competition, to grab the preferred spot on the supply curve, focus matters. Depth does not preclude breadth; however, it does require a company to excel in whatever it chooses and that's where digital technologies can help. For example, data analytics can weave legacy information across the exploration, development and production domains to identify advantaged positions. Connected ecosystems can enable a company to more effectively leverage supplier information. And access to real-time competitive intelligence can clarify how a company should best position itself. This data, coupled with a rigorous, financially-focused evaluation, will help a company identify the asset and value chain position it should take.

Optimal configuration. The portfolio of the future should seek to optimize the value realized from a delivered molecule of energy, whether delivered by the company or as part of an ecosystem. Once a company determines its core assets, it can maximize how specific assets combine to increase the value from a delivered molecule. This means a company has to decide whether to be a pure play, invest selectively across other value chain blocks or be fully integrated. Choices include heavy assets, light assets (such as micro-refineries) and asset sharing—all enabled by information exchanges that were impossible a decade ago. This decision-making continuum should take advantage of big data analytics to, for example, stress-test the trading function's ability to generate optimal value at various points across the value chain.

In a world of abundance and intense competition, to grab the preferred spot on the supply curve, focus matters.

Consumer centricity. The energy company of the future will need to pay as much attention to demand-side assets as it does to supply-side ones. This means oil and gas companies will have to invest in both hard assets (such as those related to power distribution, liquefied natural gas [LNG] regasification and consumer-retail inspired fueling stations) and information assets that leverage digital to get insights on customers’ buying behaviors and preferences, and to optimize customer (be it B2C or B2B) engagement and experience. In other words, in a world where consumers can choose from multiple transportation and power generation choices, a company will first need to understand and then predict consumer behavior. Then it can dial its producing assets up and down to maximize the value it realizes across those assets based on real-time consumer demand (Figure 3).

Figure 3: Consumer-centric energy business of the future

		Technology disruptors	New business models
Energy businesses of the future	Transportation	 Rise of autonomous vehicles	 Fleet as a service
		 Connected vehicles and sharing economy	 Logistic systems e.g. always connected
		 Technology–Multiple powertrains (e.g. fuel cell)	 Retail automation
	Power generation	 Technology (e.g. smart home, distributed generation)	 Self-driving fleet
		 Rise of renewables	 Fuel on demand
		 Enhanced energy storage/batteries	 NextGen convenience
		 Connected home	
		 Demand response (smartgrid)	
		 Beyond-the-meter solutions	
		 Buying into storage - dispatchable power	
		 Distributed generation (roof solar, microgrid)	
		 Data-related services	

HOW TO WIN: CREATING DIGITALLY-ENABLED OPERATING MODELS

In a fluid and volatile market, energy companies will have to nimbly develop tailored operating models to win in the portfolio choices they make. For example, the winning recipe and capability set for unconventional development is uniquely different from that of deepwater development. While companies can be successful in both, a focused model will be required for each.

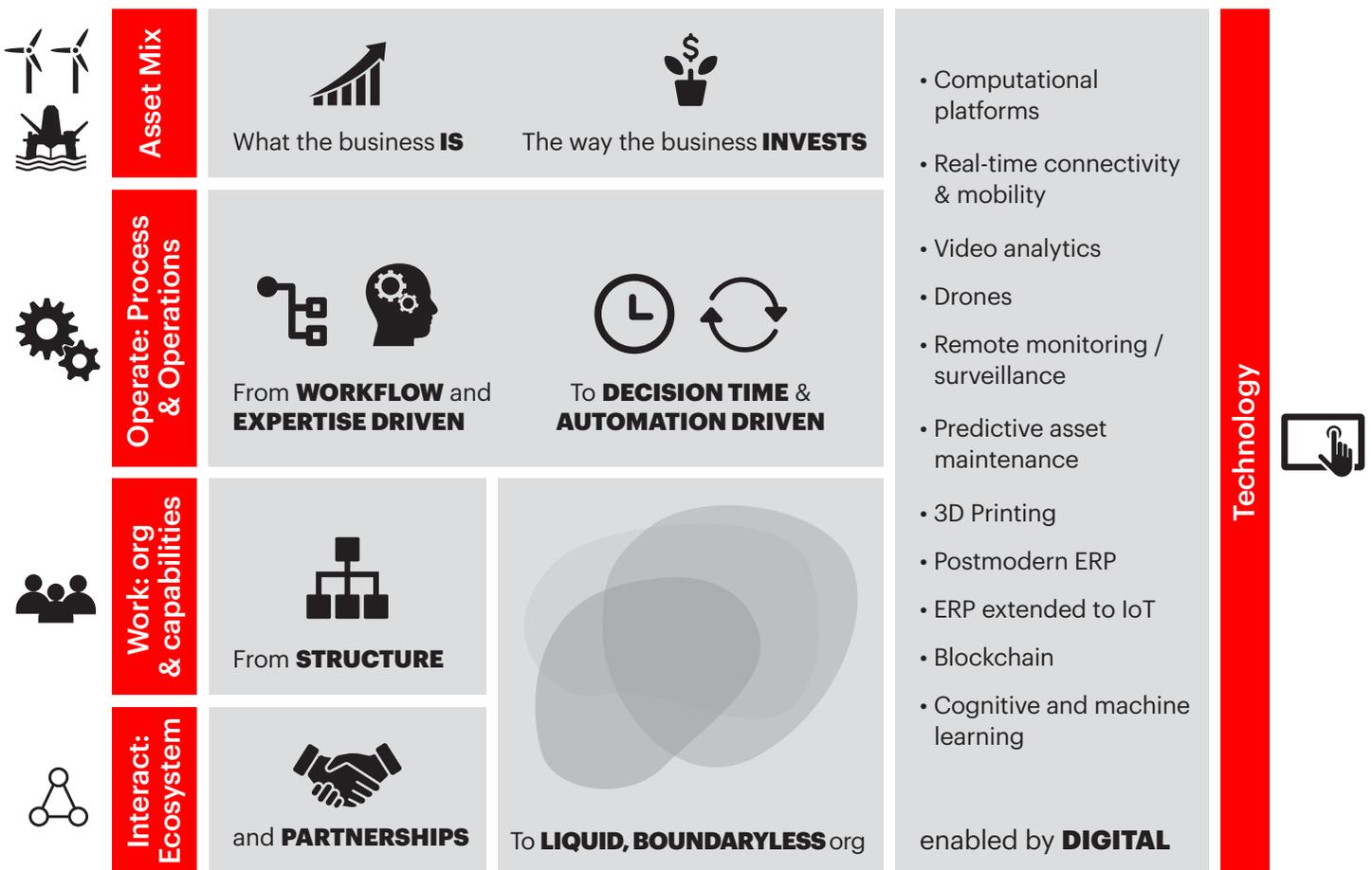
To avoid being squeezed out of the market, companies must quickly reassess the engineering solutions they're designing today to fully exploit available resources, and shift those to an operating mindset focused on achieving a return within a more specified and shorter-run economic life. This implies a standardized solution set, lighter and nimbler assets and new commercial models to interact with service providers. Even five years ago, such a fundamental transformation of the operating model would have been unthinkable. Talking about trading-off against ultimate recover-to-favor time to first oil would have been akin to heresy. Even for those who believed, the tools to execute would have been non-existent.

That's all changed, as digital has opened up a new dimension on how to win. For example, an exploration-focused company may explore through virtual models, sharing information on a blockchain-enabled network fed by multiple partners. That's a far cry from the wildcat drill-bit-driven industry culture of the past.

Changing the current focus of oil and gas companies is no easy task. To pull this off, companies will need to create the building blocks of the emerging operating models from the ground up. In essence, they must develop new processes, organization structures, ecosystem interactions and technologies (Figure 4). A common denominator in these new models will be digital technologies that make the model agile, adaptable, connected and collaborative.

COMPANIES WILL NEED TO CREATE THE BUILDING BLOCKS OF THE EMERGING OPERATING MODELS FROM THE GROUND UP.

Figure 4: How to win: Energy company of the future operating model building blocks



PROCESSES MUST CHANGE

Gone will be the processes that pass information across islands of disparate capability, favor slow, locally-optimized decisions, and result in bespoke, customized designs and 100 percent inspection mindsets. In their place will be processes that support simultaneous decision-making with integrated and accessible data across the organization to drive speed, standardized designs within reservoir types, and surgical interventions. These new processes will have to integrate streaming consumer information and connect it in real time to operational decisions, adjusting production of various assets on demand.

Consider mines in western Australia that are fully automated with autonomous vehicles that deliver ore to rail cars, which have automatic loaders and sensors, and form a long conveyor all the way to the smelter and end consumer. The conveyor is governed by a connected web of information, including the real-time price of copper on global commodity markets, the weather, the train capacity and the Chinese factory's productivity. This is today's reality in many industries.

Organizations and ecosystems will have to shift emphasis from domain expertise and local workforces to decentralized decision-making, a global connected workforce with an increasing mix of data scientists and a willingness to share data with the external ecosystem. Functions like trading and commodity management may become entirely automated with inherent machine-human interfaces having to be defined and governed. For example, think of virtual reality-enabled design and concept selection for large capital projects. Pieces of work with well-defined interfaces are managed by intelligent programs and parceled off to various parts of the extended organization across the globe. They're then brought back together to select a design with the greatest modularity and flexibility.

Technology backbones also have to change, from rigid enterprise architecture-focused systems to more flexible, platform-based systems with multiple solutions designed by a more fluid workforce. This is the change that's hard. Imagine drones on the field, or three-phased automated meters deployed into a company's operations, or algorithms that improve production surveillance, or even a free-market, gig-based workforce paid in bitcoins. And that's just the low-hanging fruit.

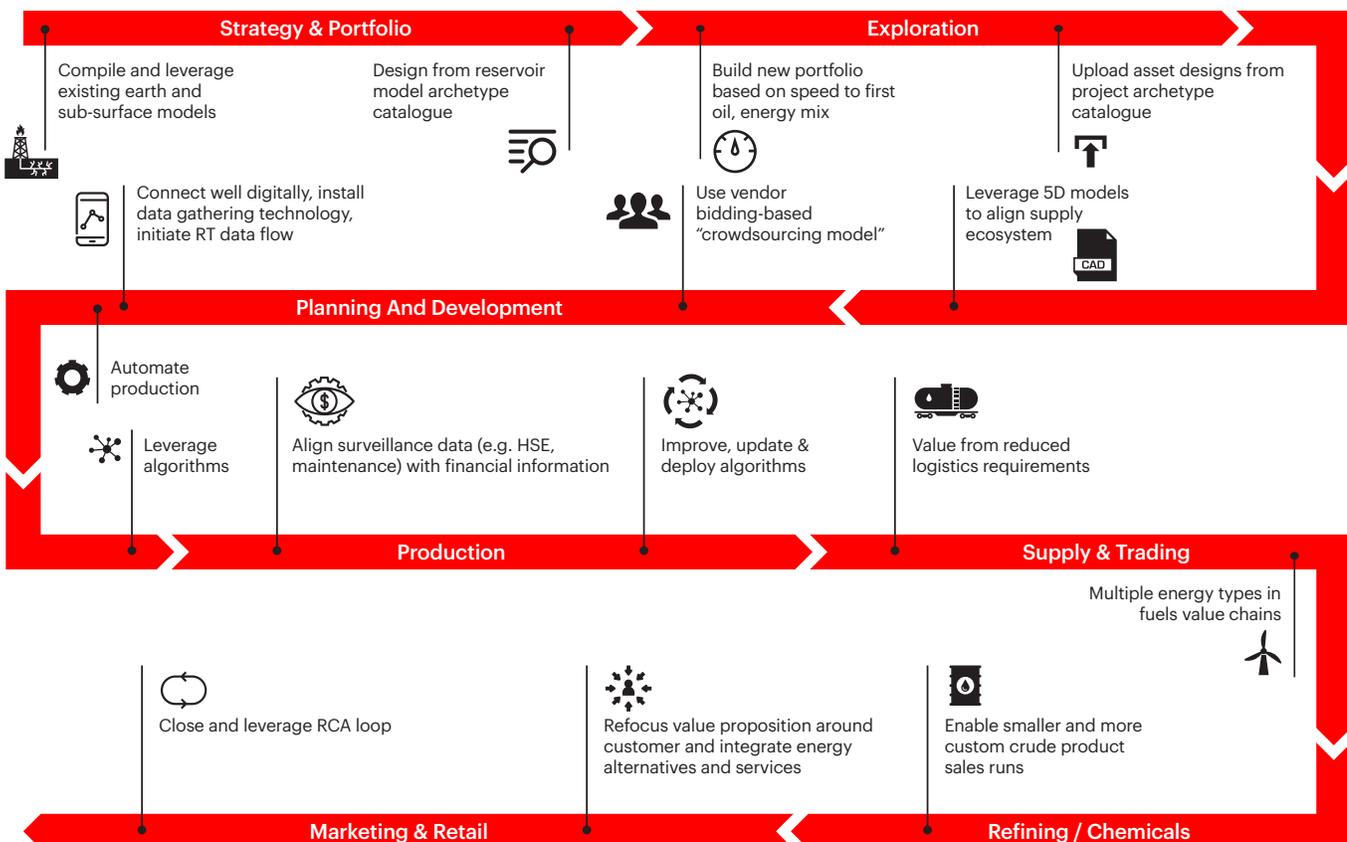
Functions like trading and commodity management may become entirely automated.

REIMAGINING THE FUTURE

Is this future scary or bright? It's probably a little of both. Companies must weigh their options and place strategic bets across the emerging transportation and generation landscapes. However, what is clear is that the agile, adaptable, connected and collaborative company has a much higher chance of winning than the large, ponderous, inflexible and insular pure-play of yesterday. Winners will lead the way in picking and developing best-in-class assets (whether hydrocarbon or non-hydrocarbon) and will carve out differentiated positions wherever they play (across energy manufacture, transport or delivery). And they will support their chosen direction with optimized, digitally-enabled, fit-for-purpose operating models with an ability to reimagine every step of the value chain (Figure 5), influencing consumer choices and cumulative demand.

Companies must weigh their options and place strategic bets across the emerging transportation and generation landscapes.

Figure 5: Reimagining the entire value chain



The future value chain may have some of the same elements we have today. However, the emphasis will likely shift from finding, developing and producing a generic commodity to optimally bringing to market and delivering a source of energy that maximizes the utility of the end consumer.

**FOR THOSE THAT
CAN PULL IT OFF,
THE FUTURE HAS
NEVER BEEN
BRIGHTER.**

JOIN THE CONVERSATION



@AccentureStrat

@AccentureEnergy



[www.linkedin.com/company/
accenture-strategy/](http://www.linkedin.com/company/accenture-strategy/)

[www.linkedin.com/company/
Accenture_Energy](http://www.linkedin.com/company/Accenture_Energy)

CONTACT THE AUTHORS

Vivek Chidambaram

vivek.chidambaram@accenture.com

Muqsit Ashraf

muqsit.ashraf@accenture.com

Manas Satapathy

manas.r.satapathy@accenture.com

OTHER CONTRIBUTORS

Adeeb Gharzouzi

adeeb.gharzouzi@accenture.com

Daniel Jaouiche

daniel.jaouiche@accenture.com

NOTES

¹ “World Energy Scenarios 2016: The Grand Transition,” <https://www.accenture.com/us-en/insight-world-energy-scenarios-exploring-grand-transition>

Copyright © 2017 Accenture

All rights reserved.

Accenture, its logo, and High Performance Delivered are trademarks of Accenture.

ABOUT ACCENTURE

Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Combining unmatched experience and specialized skills across more than 40 industries and all business functions—underpinned by the world’s largest delivery network—Accenture works at the intersection of business and technology to help clients improve their performance and create sustainable value for their stakeholders. With more than 394,000 people serving clients in more than 120 countries, Accenture drives innovation to improve the way the world works and lives. Visit us at www.accenture.com.

ABOUT ACCENTURE STRATEGY

Accenture Strategy operates at the intersection of business and technology. We bring together our capabilities in business, technology, operations and function strategy to help our clients envision and execute industry-specific strategies that support enterprise-wide transformation. Our focus on issues related to digital disruption, competitiveness, global operating models, talent and leadership helps drive both efficiencies and growth. For more information, follow @AccentureStrat or visit www.accenture.com/strategy.

This document makes descriptive reference to trademarks that may be owned by others. The use of such trademarks herein is not an assertion of ownership of such trademarks by Accenture and is not intended to represent or imply the existence of an association between Accenture and the lawful owners of such trademarks.