



# Reinventing the Energy Workforce for a Net-Zero World



# **Introduction: New Market and Workforce Dynamics**

## Converging energy marketplace trends, as well as evolving employee expectations, are prompting oil and gas (O&G) operators to reimagine the make-up and performance of their workforces.

Energy market dynamics—including the near- to intermediate-term reduction of hydrocarbon demand and the longer-term shift to cleaner energy sources to meet decarbonization commitments—require a different workforce, comprising employees, contractors and bots, to turn vision into reality. The COVID-19 pandemic made it clear that remote working can be performed at scale. Concurrently, employee expectations about how, where and why they want to work are evolving, and members of the younger generation are demanding more purpose and flexibility in their work and careers.

**As O&G operators begin the journey to address these market and workforce dynamics, it is imperative to address several industry-specific needs:**



### Attracting and retaining the best people to build a supply chain of talent:

As the industry battles an economic downturn and enters another cycle of workforce reduction, attracting young professionals to embark on energy careers becomes increasingly challenging. In fact, according to the UK's Higher Education Statistics Agency, the number of graduates joining the O&G upstream sector has fallen by 61 percent in the last four years.<sup>1</sup> In addition, many petrotechnical professionals have retired, while those who wish to rejoin the industry lack the skills required by the latest technical enhancements. These combined trends threaten to lead to another generation-related skills gap, similar to that faced by O&G operators in the early 2000s as a result of a lack of hiring in the 1990s.



### Responding to workers' environmental concerns:

Cross-industry research from National Grid, in partnership with Development Economics, found that people are "looking for a job with environmental purpose." More than eight in 10 women and seven in 10 men say they want to play a role in tackling climate change.<sup>2</sup>



### Creating entirely new skillsets and roles:

Digital innovation, coupled with new asset portfolios and the technology required to achieve decarbonization goals, will create new technical professional roles and redefine existing ones.



### Investing in learning:

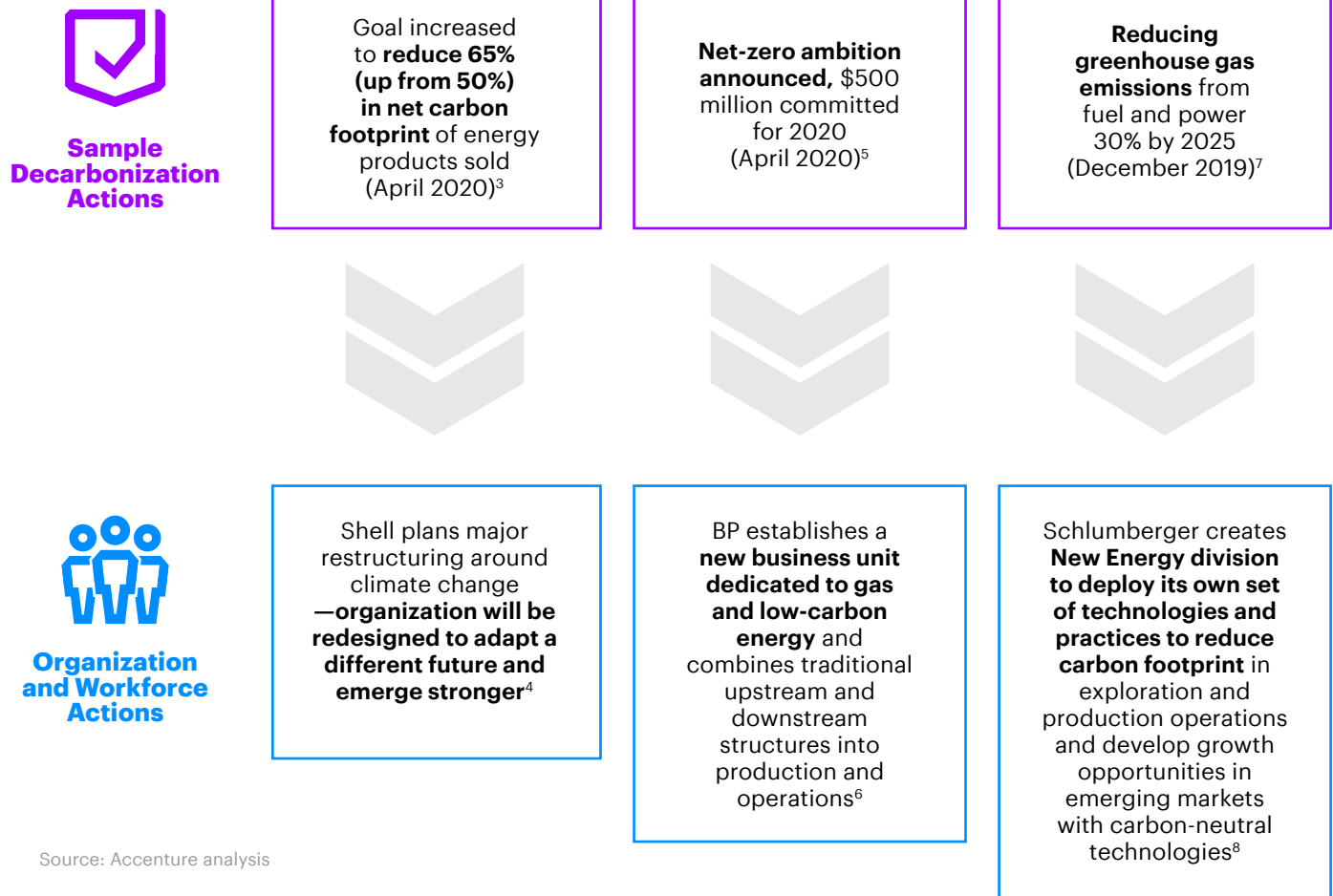
It requires several years to adequately train recent graduates for petrotechnical roles and to qualify professionals for the new asset portfolios. Nevertheless, given uncertain market conditions, some operators are reluctant to invest adequate time and resources in new learning opportunities.



### Supporting responsible leadership:

A new breed of responsible leadership is required—one that leads with curiosity, compassion and courage. Such leadership builds diverse teams, maintains trust and confidence at all levels, is open to outside views, and is willing to learn.

Although these are significant hurdles, many operators have stepped up to the challenge, as shown in Figure 1. Several O&G majors are pursuing aggressive internal operating model restructures, cultural shifts and new-skilling agendas to ensure they are positioned to lead the energy transition.

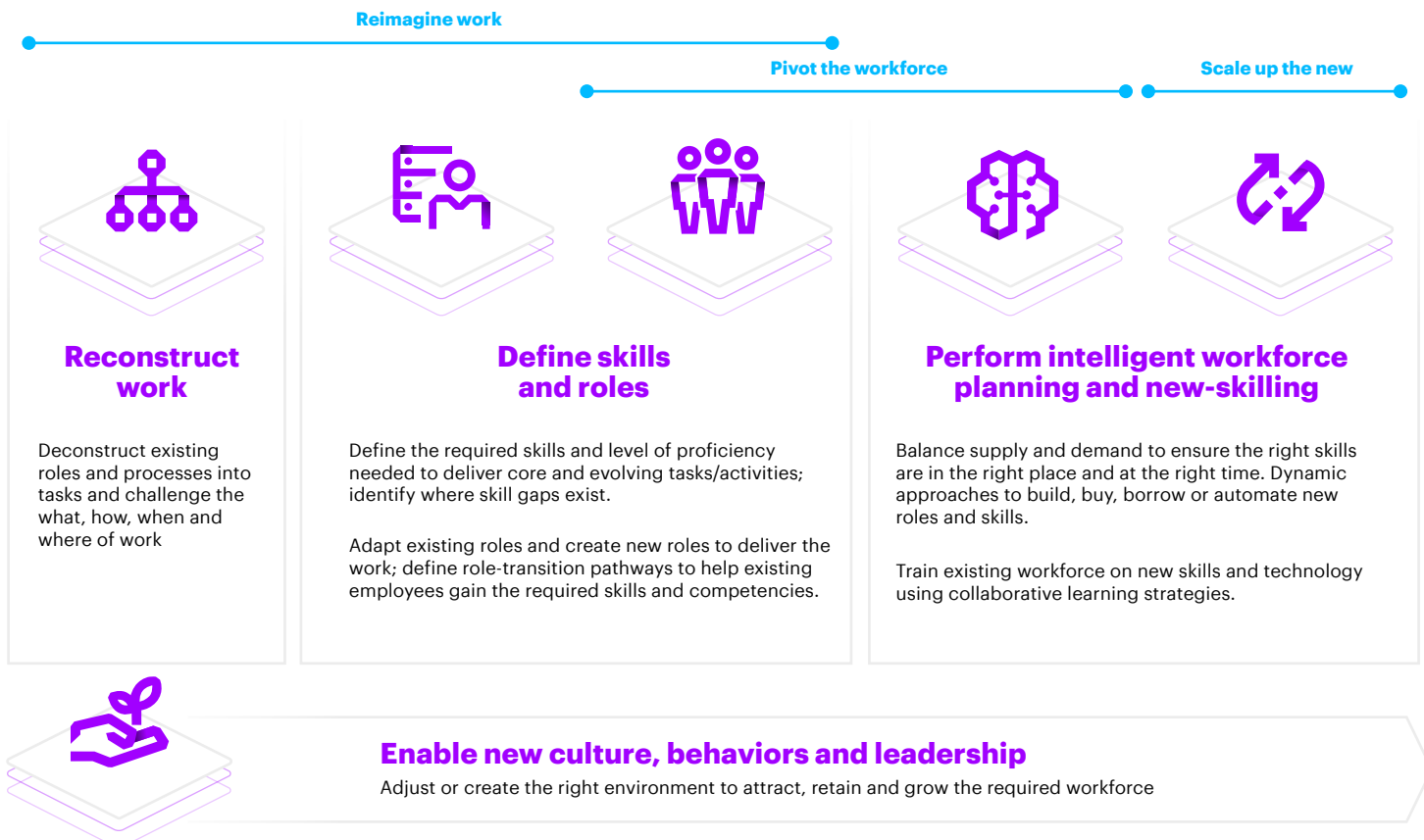
**FIGURE 1****Effects of decarbonization on people and the organization**

# Talent Strategies to Enable a New Energy Workforce

The energy industry needs new talent strategies to reimagine a supply chain of talent that can evolve to support both current and future market changes. Accenture believes there are several critical aspects to transforming the workforce (see Figure 2):

- **Reconstruct work:** Rethinking how workers complete tasks, support new work methods, and embrace new and evolving technologies will be required to adapt to the new work-life requirements.
- **Define skills and roles:** Identifying and understanding role-transition pathways will be essential to manage new and existing talent.
- **Enable new cultures, behaviors and leadership:** Shifting fundamental culture and mindset will help engrain and support new behaviors that are sustainable over time. Effective leadership from the top will be required to make the changes sustainable.
- **Perform intelligent workforce planning and new-skilling:** Adopting processes to maximize talent through a forward-looking, predictive approach to enable the adaptability and agility needed to quickly respond in an ever-changing environment.

**FIGURE 2** Reimagining the energy workforce





# Reconstruct work

Changes to technology and business models have shifted the entire worker dynamic, which in turn has fundamentally changed the workforce. Technologies such as artificial intelligent (AI), analytics and automation have driven new forms of interaction between humans and machines, enabling workers to become more productive and creative, and to make more insightful decisions.

**The key characteristics of work—namely the what, how, where and when work is performed—is evolving because of trends such as:**

## Workplace hyper-connectivity:

New technologies including big data, cloud and analytics, which enable access to vast amounts of data, allow teams to quickly optimize and iterate designs, accelerate changeover times and streamline operations.

## Automation and augmentation:

Our research<sup>9</sup> shows that 50 percent of a worker's time can be augmented using current intelligent technologies and 20 percent of core processes can be automated.

## Work distribution and orchestration:

Energy companies are leveraging remote working to challenge typical work processes, as well as how and where individual tasks are performed at speed and scale.

These features apply to many of today's work processes. For example, the process for identifying, defining and executing maintenance programs for a specific operating asset such as a refinery was historically done on site. Now, though, tasks can be distributed across onshore, near-shore and offshore locations, leveraging not just engineers, but technicians, operators and bots.

Codifying these reconstructed workflows will require new, agile and intelligent operating models that enable flexibility and adaptability, enhanced by human-machine collaboration.

**For example, some operators are exploring the use of organizing principles such as specialized front offices, predictive middle offices and highly automated back offices, which include concepts such as:**

- 01** | Asset- or customer-facing units (e.g., front offices) that address customer, market or asset needs. The work and skills required from front offices will evolve as the demands on each part of the value chain evolve.
- 02** | Agile middle offices designed to provide flexible, multi-disciplinary support and analytical insight to drive front office innovation. Moving front office work such as planning, strategy development, and optimization to the middle office can provide flexibility to throttle back and forth both production and cost. With the appropriate ecosystem arrangements, the middle office can ultimately enable a move to a variabilized cost base.
- 03** | A set of highly efficient, automated and business-relevant back office support services tasked with delivering world-class, industrialized services. The back office needs to be able to meet the timelines and priorities of the front and middle offices they are supporting. They will drive value through continuous efficiency and automation.

## Define skills and roles

As the work performed within an energy company changes, we have observed widening skills gaps, creating the need for new roles and for individuals to become proficient in several new and emerging areas. It will be critical for leaders to identify new roles and skills, and define potential transition pathways—in effect, equipping existing employees with the necessary skills for the future. The following focuses on some components of the O&G value chain where we have observed, or anticipate, important changes to skills and roles.

## Exploration and production

Driven by the decarbonization agenda and the need for economic competitiveness, capital investments to find new hydrocarbon reserves and construct new wells will be limited, with focus shifting to more profitable in-fill activities (i.e., production from existing hydrocarbon reservoirs). Consequently, traditional exploration roles such as geologist, geophysicist and reservoir engineer (GGRE) will no longer be the beating heart of O&G companies. Further compounding the declining demand for these roles is the availability of technology to automate key activities such as data aggregation and even parts of data interpretation. Similarly, when thinking about the oilfield itself, O&G companies have begun to automate and perform field activities remotely, materially reducing the demand for wellsite-related skills found in completion, production and maintenance engineers and technicians.

The demand for skills and roles in the exploration and production value chain will shift. For example, the industry will require data scientists who can develop complex algorithms and analyze petabytes of information pouring in from field sensors or from the digitization of paper-based geologic surveys. Accenture estimates that more than 12,000 data scientists will be needed to support the upstream O&G industry.<sup>9</sup> Similarly, GGRE and other engineering roles will be needed to support capital investments in new asset classes including solar, wind, geothermal and hydrogen. Each of these alternative energy sources will play an important role in the future energy mix. Additionally, the industry will need a “human + machine” lens to define the new workforce that will be required—for example, fewer traditional maintenance engineers will be needed for offshore wind as the remote operations of the future are built in from the beginning.

Given the inherent STEM (science, technology, engineering and math) competencies of today’s exploration and production workforce, upstream operators have the opportunity to define the best transition pathway from a traditional geologist or drilling engineer role to a more data-/digitally focused or alternative energy role.



## Transportation and storage – Refining and manufacturing

For simplicity, we have collapsed these segments because many of the skill shifts and rationale for change are similar. In the transportation and storage value segment, new hydrocarbon and/or refined product pipeline construction is likely to decline gradually. Roles related to designing and building these infrastructures will be needed less frequently or will be repurposed for other transportation fuels such as hydrogen. From an operational expenditure perspective, the value chain will still require pipeline maintenance and schedulers, but the work will increasingly be driven by automation. Similarly, there will be a shift away from pipeline management and toward distribution optimization across more complex projects. Comparable trends are apparent as the refining and manufacturing segment reinvents itself, driven by limited capital investments, overcapacity, automation and remote operations. Key shifts include the need for cross-functional downstream skills, as most refiners begin to manage their business in geographic value chains (e.g., from crude to refinery to customer).

New skills required in the transportation and storage segment will include automation, digital control and cybersecurity. Companies will increasingly emphasize commercial skills and mindsets, which will empower schedulers and operators to make more economic decisions, trading off operational outcomes and commercial impacts. For refining and manufacturing, new roles and skills will focus on identifying and utilizing lower-carbon production methods, promoting energy and resource efficiency, improving heat recovery and other similar tasks. This segment will need new technical carbon skills and professionals experienced with alternative energy sources such as biofuels and green hydrogen.



## Marketing and trading - distribution and retail

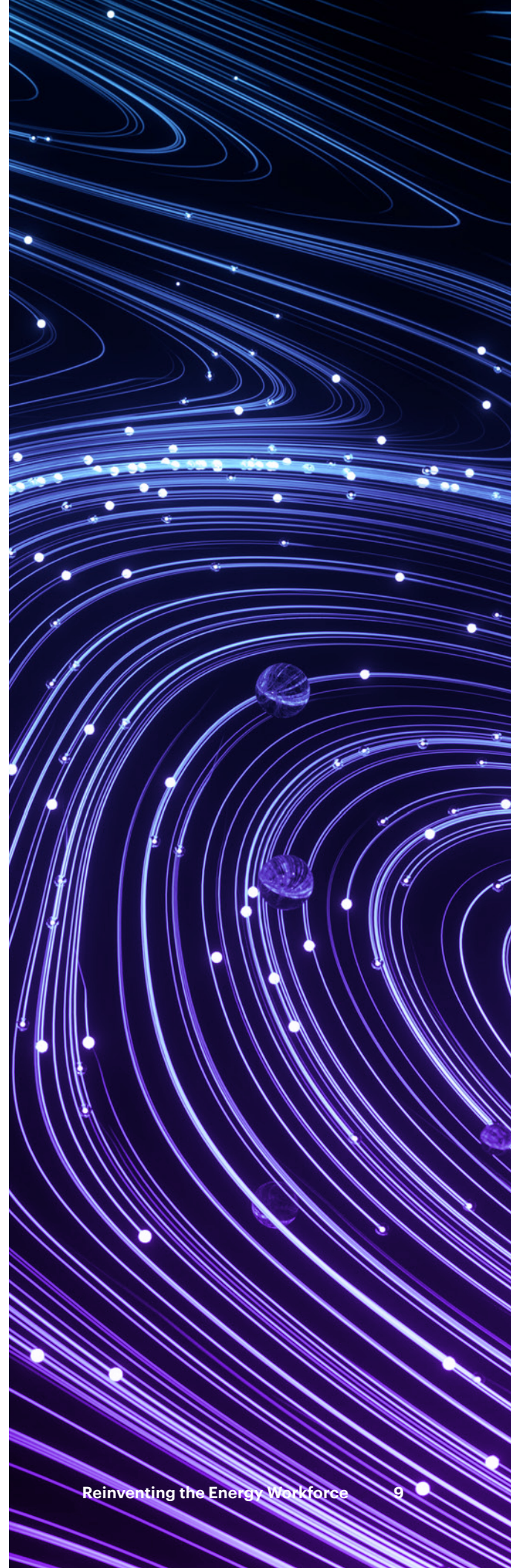
Again, for simplicity, we have collapsed these segments because many of the skill shifts and rationale for change are similar. Within the energy value chain, we anticipate that marketing and trading professionals will be operating amid more challenging supply-demand dynamics, increasing forecast complexity because of more varied energy sources, more players and a more uncertain economic environment.

Trading capabilities to offset emissions will emerge and play a critical role. It will become increasingly important to reinvent the marketing and trading model with flexible trading capabilities, vertical integration and customer-centric marketplaces. The monetization of data analysis and insight will be key to creating new and constantly evolving offerings. The trends toward more analytics-driven or fully automated trading (front, middle and back office) will alleviate the demands of relationship- or experienced-based trades.

These shifts will require new skills, or perhaps an added degree of competency in data management, data science, visualization and commercialization/offering development.

Changes in fuel consumption and transportation will impact fuel retail companies dramatically. They will need to review the sources provided, as well as their location, time to fuel, and the make-up of all associated services. As fuel retail companies look to diversify and expand into new markets, they will increasingly come up against companies that are built “from the customer up” and that encourage managed risk and proactive reinvention.

A product-based fuel business with an engineering and risk-averse mentality will have less chance of success in the future. A focus on customer-centricity will become even more important, requiring organizational capabilities to develop a compelling customer offering with a powerful go-to market approach for both B2B and B2C.



## Enable new cultures, behaviors and leadership

Job re-definition and talent development will not occur at scale without defining the necessary culture (i.e., “the way we do things around here”) and prioritizing the right behaviors (i.e., the outward signs of culture observed, heard or seen among teams). For example, energy companies will need to establish mechanisms to support work around decarbonization initiatives, measuring emissions effectively, and developing and marketing alternative fuels.

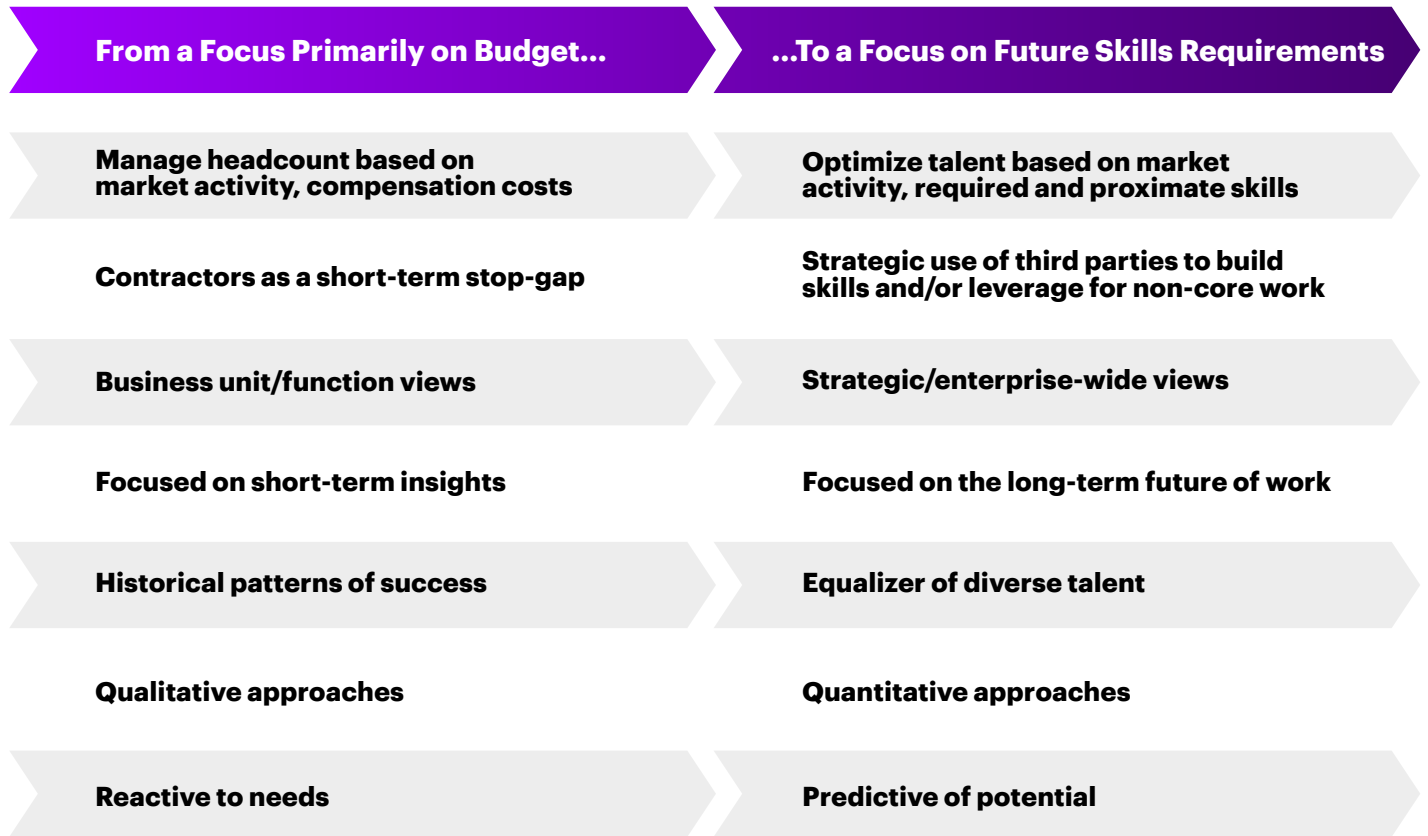
To complement these efforts, energy companies should define a clear, socially responsible and sustainable vision or purpose, enabling their workforce to find meaning in their work. By example, several major O&G companies have made public announcements about their commitment to climate change and sustainability (see Figure 1). These actions not only enable the re-invention of the energy workforce, but also attract talent by addressing any lingering negative perceptions of the energy industry.

From a leadership perspective, balancing and managing the mix of human talent with machine-based intelligence will be key to success as O&G companies reshape themselves for a new future while also looking to scale. Leaders will need to increase their own technology understanding and be able to build and deploy new talent. They also need to maximize productivity through partnerships and investments in new, innovative technologies, all while maintaining the workforce’s trust and confidence. Strong influence from the top will be critical to driving sufficient, long-lasting change that inspires a new, future-ready workforce.

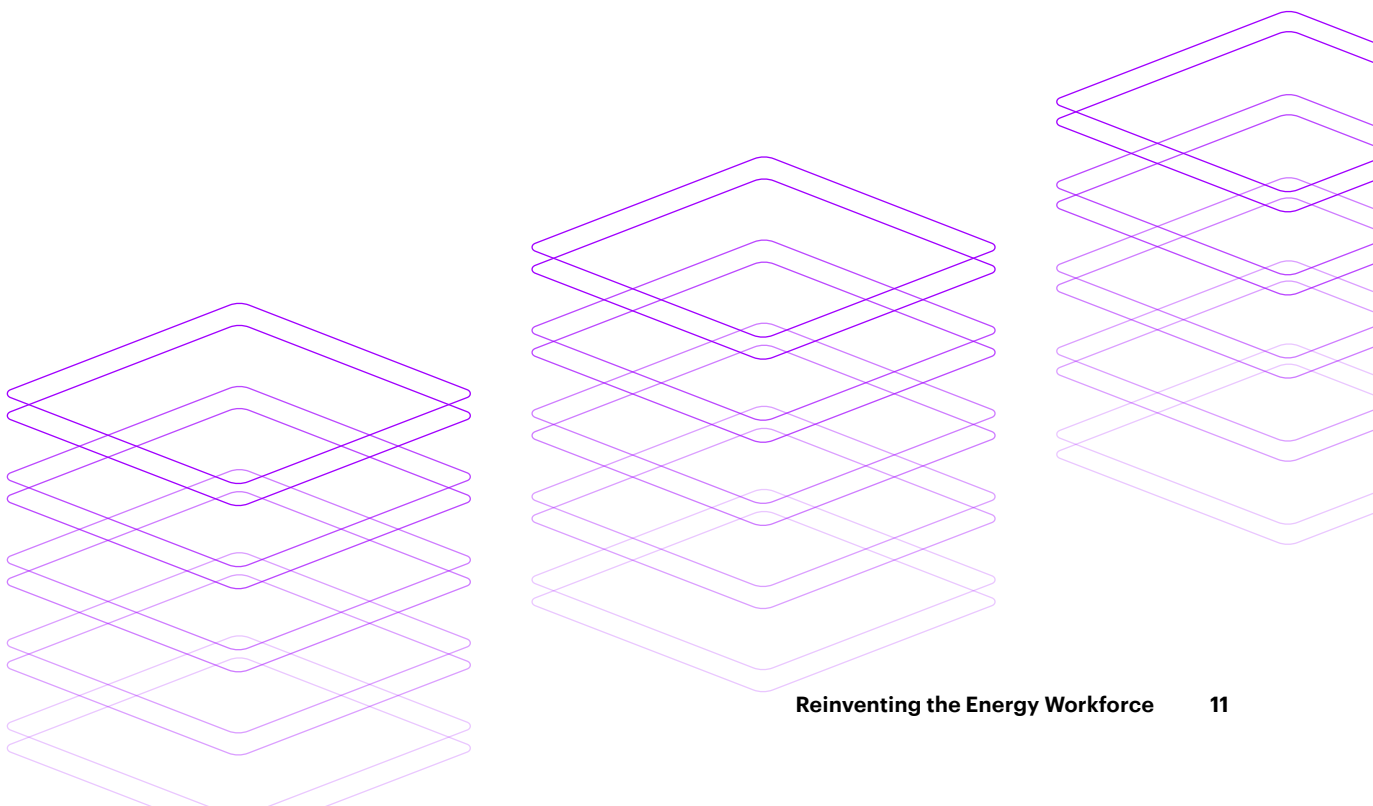
## Perform intelligent workforce planning and new-skilling

After defining the right mix of skills and roles for the expected work, energy companies need to ensure they are available at the right place and the right cost. To overcome this hurdle, they will need to shift their talent management philosophy from a “focus primarily on budget” to a “focus on skills,” as shown in Figure 3. The capability to dynamically forecast both supply and demand of skills and resources will require very particular, and perhaps new, skillsets and approaches from HR and manager roles. Specifically, these roles should be able to interpret and assess the capability of their workforce using the visualized outputs of artificial intelligence and machine learning algorithms on their human capital platforms.

**FIGURE 3** A new focus for talent management



Source: Accenture analysis



Additionally, O&G companies will need to consistently “new-skill” their workforce to effectively keep pace with new and emerging skills. Employees will need to learn and apply these skills in new ways. The learning mindset will shift from an emphasis on “training” to “how the learning experience helps people perform better,” as shown in Figure 4. Companies will need to feed curious and advancement-hungry minds so workers can improve continuously.

To keep pace with the “new,” organizations also need to adapt skilling by:



**Building** upon existing capabilities to be more adept at handling the demands of new roles.



**Adapting** and enabling workers to perform effectively and deliver in a changing professional and digital landscape, in either a current or new role.

**FIGURE 4** The new learning mindset

Current Learning Mindset: Training People	New Learning Mindset: Enabling People to Perform Better
Training-based	Performance-based
Create content	Buy and curate content
Waterfall delivery	Agile delivery
Scheduled	Anytime, on-demand
Classroom	Everywhere
Printed learning materials	Digital learning
Passive learning from experts	Active knowledge sharing
Attendance is critical	Individual is in control

Source: Accenture analysis



# A New Journey with a New Roadmap

O&G leaders have an exciting opportunity to reimagine their workforce while they navigate the energy transition. Now is the time to ask thoughtful questions such as: How can we re-skill the workforce to transition to low-carbon roles? How can we bridge the gap and identify the levels of crossover and proximity between current carbon-intensive skills and new, low-carbon skills? What will be the evolution of roles facing high disruption? How can we compete more effectively for talent by offering employees purposeful personal development and career progression?

There is a new, clearer roadmap to addressing these questions: reconstructing work; defining new skills and roles; enabling the right culture and behaviors; adapting leadership competencies; performing intelligent workforce planning; and putting in place new-skilling initiatives. The journey is without precedent, but that's both the challenge and the excitement.



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# Endnotes

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