

# Innovation in Oil & Gas: Canada 2016

## FOREWORD

Innovation has never been more critical for the Canadian oil and gas industry. With the oil sands near the top of the global supply cost curve, the challenge for the industry is how to create a sustainable and more productive business under the current pricing environment. Innovation is the key to this challenge and it is at the heart of our motivation to launch this study, and the objective of which is to shine a light on the state of play of innovation in the Canadian oil and gas sector. This year's oil and gas study comes on the heels of a similar global study that Monitor Deloitte conducted in the mining industry whereby a decline in global commodity prices have likewise forced the industry to look towards innovation as a way to make a step change in productivity and public perception.

In the following pages, we explore the many ways in which oil and gas companies can innovate as well as what organizational capabilities they will need to build in order to become systematic innovators. The key challenge for oil and gas companies is to drive innovation beyond the technical and R&D groups and into the wider organization. The findings underscore the importance of going beyond acknowledging the critical need to innovate, and beginning to act upon this imperative in a focused, coordinated way.

This year's study would not have been possible without the help and support of the oil and gas companies that agreed to participate. With representation across the industry, the study provides a powerful lens through which we can access how well the industry is tackling the topic of innovation. Our hope is that the study will catalyze conversations within companies, but also within the wider industry on how innovation can help improve the overall competitiveness of the Canadian oil and gas industry.

We thank all participating firms for their support in this critical dialogue.

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# Innovation in Oil & Gas: Canada 2016

## Hitting a critical juncture

In an environment of sustained low prices, high costs, and increasing complexity, the need to innovate has never been so pressing for oil and gas companies. But, is the “innovation imperative” widely embraced as a reality within the oil and gas industry or is it still up for debate? A study recently conducted by Monitor Deloitte (Deloitte) examined current perspectives on innovation in an age of rising costs, multiplying risks, increasing environmental concerns, escalating activism and shrinking margins.

The general consensus? The industry is at a critical juncture where companies must go beyond merely acknowledging the need to innovate and start executing upon this imperative in a systematic way or else their long-term survival may be in jeopardy. Despite this urgency, most respondents indicated they presently do not have the resources, capabilities or leadership commitment to innovate to the degree they know they should. Factor in the oil and gas sector’s risk-averse culture and its intense focus on operational efficiency, and companies’ capacity to innovate broadly and systematically contracts even further. And, this contraction is coming at a most inopportune time.

The drive for innovation is increasing as a perfect storm of forces converges on the industry. Through innovation in operational excellence, several smaller players over the last few years have demonstrated that reserves in unconventional plays across North America could be economically unlocked. However, more recently, low oil and gas prices have made exploitation of difficult-to-access reserves uneconomical once again, leading to gradual retrenchment and consolidation across the industry. Simultaneously, growing concern regarding conservation and the potential environmental impacts of oil and gas development have produced a highly organized advocacy infrastructure, which is increasingly exercising power to influence the behavior of governments, corporations and society

at large. In addition, the industry is facing disruption in how work gets done and potentially even the business it finds itself in, due to advances in clean energy technology, the Internet of Things (IoT) and connected computing.

Ten oil and gas companies (all integrated upstream players) participated in the study, representing about 67% of the production in Canada. Of them, most see innovation as the key to survival—both as a way to become globally competitive in terms of costs and as a means of shifting the public perception of the oil and gas sector, and particularly of the oil sands, into a safe, sustainable, and economically feasible option. In light of the new Canadian government’s climate change agenda, companies are increasingly expected to create value across the triple bottom-line of cost, environmental sensitivity and social license to operate. The realization that the industry is not doing enough is emerging and the call to convert awareness into action is getting louder.

## IN YOUR OWN WORDS

*“We have to get our costs down, or we won’t survive. We have to get our environmental impact down, or we won’t be given permission to thrive. In order to do both, we have to get very busy on innovation.”*  
—VP Mid-stream Integrated player

*“We are of the mindset that we provide fuel. We may have to rethink that to be about providing energy that society wants.”* —EVP Integrated player

*“We have a lot of things developed to work better, but it’s difficult to implement those changes into operations. The company is quite siloed, and even within functions we have a ‘not-invented-here’ mentality.”* —VP Operations Integrated player

# 01

## Vocabulary lesson: the innovation imperative

The word *innovation* is used to describe everything from the invention of the wheel or first moon landing to new hairstyles or colours of adhesive notes. It's a fuzzy word that most everyone can rally around. And, in their own ways, they are right.

However, to make innovation more meaningful for business, Doblin offers the following definition:

***Innovation is the creation of a new, viable business offering.*** Simple enough, but more to the point:

***Innovation [as separate from invention] is the creation of a new [to our market or the world], viable [creating value for both our customers and ourselves] business offering [ideally going beyond products to platforms, business models and customer experiences].***

Innovation is complex, to be sure, but it's not always *complicated*. Moreover, it can also occupy one of three "ambition levels," which define its purpose or result:

**Core** innovations optimize existing products for existing customers.

**Adjacent** or **incremental** innovations expand existing business into "new to the company" business.

**Transformational** or **new** innovations are breakthroughs and inventions for markets that don't yet exist.

### Study guide

While the desire or imperative to innovate is as old as business itself, innovation is too often asked to solve both the problem *du jour* (reducing capital intensity, for instance) and *every other* problem at hand. But asking so much of innovation can dilute an enterprise's capacity to use it to its greatest advantage. That's why Doblin, Monitor Deloitte's innovation unit, promotes a multi-faceted approach to innovation that can increase innovation "hit rates" and help companies generate advances that earn disproportionate returns.

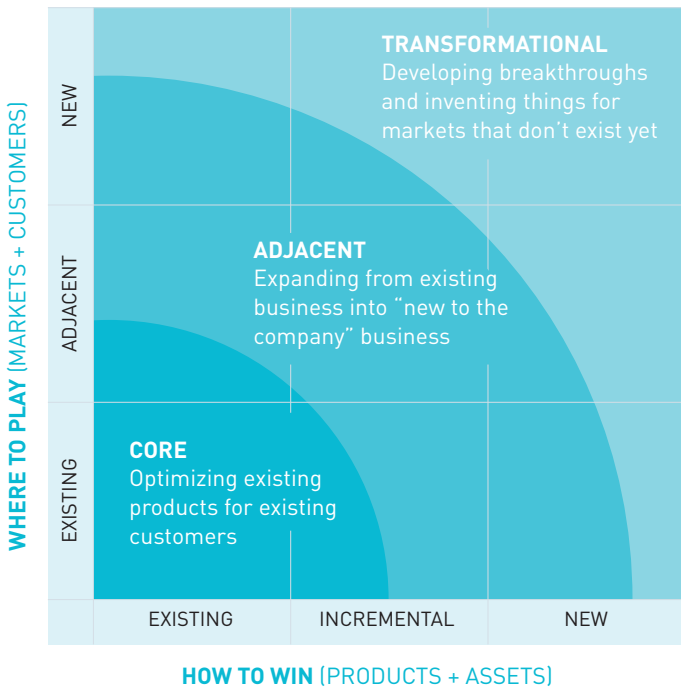
However, it's a lot easier to say innovation than it is to *do* it, no matter the context or milieu. Through a series of executive interviews and using the Innovation Scorecard survey methodology developed by Doblin, the aim of this study was to assess participants' current innovation efforts, build a deeper understanding of key pain points and gaps in companies' innovation capabilities, and explore the broader issues the sector faces and the opportunities companies wish to exploit by becoming more effective at innovating. The essential idea was to engage oil and gas companies and understand how they are innovating in order to identify ways to strengthen and enhance their efforts.

The results reveal an oil and gas sector that has begun to innovate in select areas—such as reducing or eliminating water usage—but that has yet to make innovation a strategic priority and to act upon it in a consistent or integrated way.

More specifically, the study found that respondents were largely sporadic when it comes to innovation, with most of their focus being placed on technological solutions to optimize old techniques "as needed." Indeed, innovation is commonly interpreted in two ways across the industry: 1) reduce costs through operational excellence; and 2) find a better way to extract. Everyone, therefore, has some way to go in embracing innovation as a means of growing revenues and transforming their businesses, including how they are perceived publicly.

Ambition levels serve not only as a useful way to align activities with the goals and objectives that innovation aspires to achieve, but also as a framework to manage innovation investments. Doblin research suggests that the most successful innovators manage their innovation efforts and investments as a portfolio of activities that is balanced *across* the three ambition levels (see Figure 1). And while every company's circumstances are unique, the world's leading innovators have on average 70% of their innovation investments and activity occurring at the Core level, 20% at the Adjacent level and 10% at the Transformational level.

**Figure 1.** Innovation ambition levels



However, returns on innovation investment tend to work in the reverse order: 70% from Transformational innovation, 20% from Adjacent and only 10% from Core.

### INNOVATION IN ACTION

*Within the oil and gas industry, companies are making progress across all three ambition levels. Examples include **extraction of zircon and titanium from oil sands tailings**, along with the simultaneous reduction of volatile organic chemicals (VOCs), water usage and greenhouse gases (Transformational); the development of **Thermal Assisted Gravity Drainage (TAGD)** for more sustainable extraction (Adjacent); and the use of **rupture-detection technology** for improved pipeline spill prevention (Core).*

## Revel in the details

Innovation’s complexity doesn’t end with ambition levels. Unfortunately, many oil and gas companies still think of innovation as being technology-led, meaning it is a product of R&D or technology groups. The challenge for organizations is to think about innovation more broadly. Indeed, Doblin identifies ten distinct *types* of innovation<sup>1</sup> across three categories (see Figure 2):

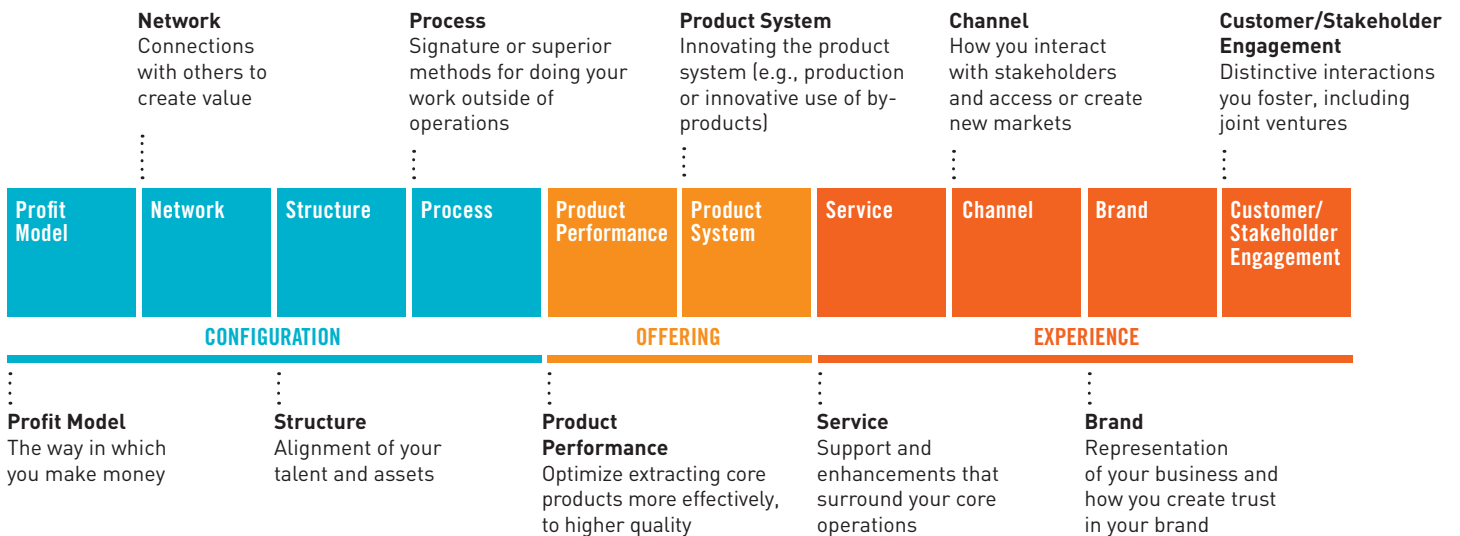
**Configuration** innovations apply to profit models, networks, structures and processes. This comprises the “back of the house” activities needed to develop the offering.

**Offering** innovations apply to product performance and product systems. This is what companies produce.

**Experience** innovations apply to services, channels, brand, and stakeholders. This is how an offering is delivered to customers and how stakeholders are engaged as a company performs its business activities (e.g., through regulatory affairs and community relations programs).

As it happens, top innovators across all industries outperform the S&P 500 in relation to how many different types of innovation they pursue (see Figure 3). We also find that the most shareholder value accrues not from Offering innovations (i.e., product performance or product system), but rather from Configuration innovations or Experience innovations.

Figure 2. Ten Types of Innovation® for the oil and gas industry



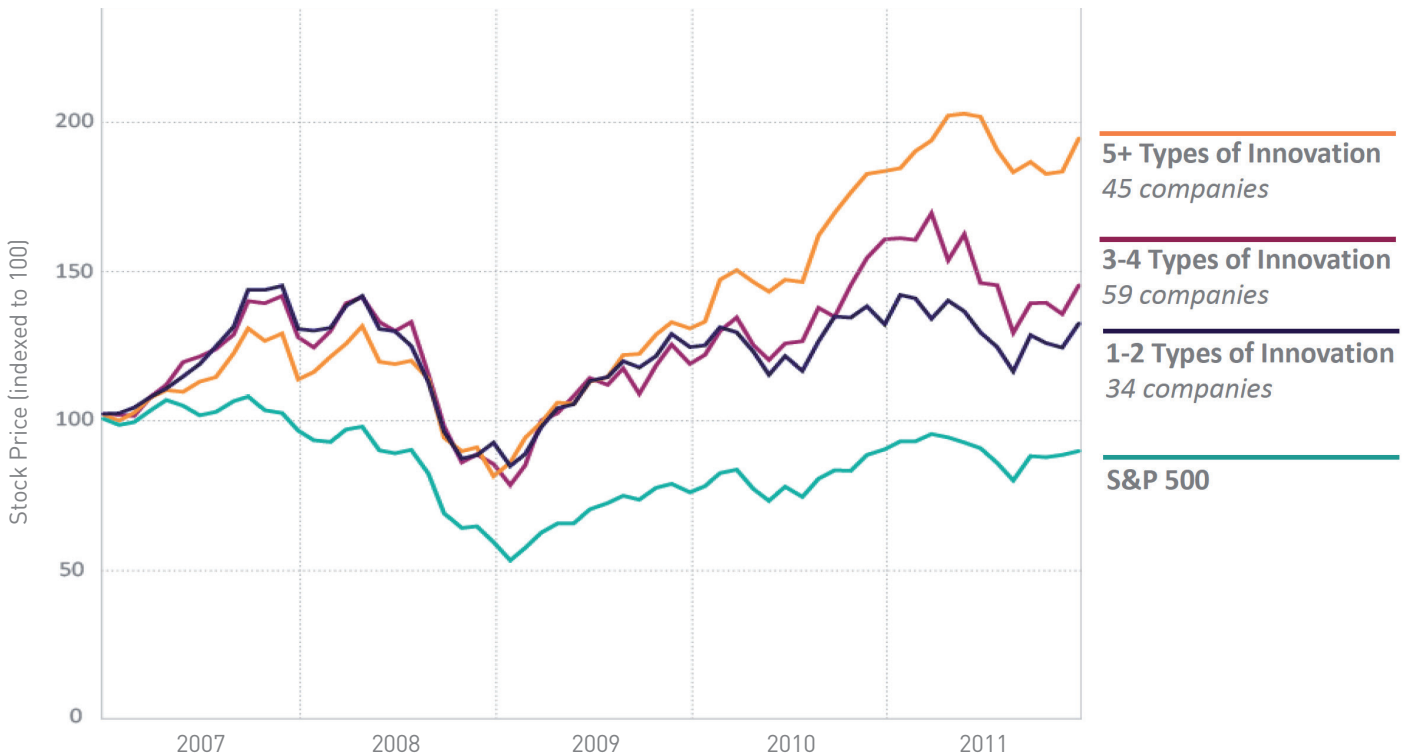
1) Ten Types of Innovation: The Discipline of Building Breakthroughs  
<http://www.amazon.com/Ten-Types-Innovation-Discipline-Breakthroughs/dp/1118504240>

## INNOVATION IN ACTION

**ExxonMobil's** refineries and chemical plants accounted for about 80% of its energy consumption and 50% of its greenhouse gas emissions. To improve this situation, the company created a **Global Energy Management System (GEMS)**, which uses a systematic approach and global expertise to identify and execute energy solutions. Through GEMS, ExxonMobil has not only reduced its energy consumption, and thus lowered its operating costs, but also decreased its carbon footprint.

Source: <http://oaktrust.library.tamu.edu/bitstream/handle/1969.1/5607/ESL-IE-05-05-46.pdf?sequence=4&isAllowed=y>

**Figure 3.** Analysis done in 2012 of the five-year indexed stock price returns of the top innovators vs. S&P 500



To drive innovation past just technology requires organizations to mobilize beyond the technical and R&D groups and into the wider organization. It is here that traditional structures can work against oil and gas companies. Some examples include:

1. When identifying new technologies that could make step changes in performance, innovators frequently face resistance because the organizational incentives are not aligned. Often, it is expected that operations will jump at the new technology. However, this won't occur if managers are being incentivized on short-term production performance, since they will perceive the risks inherent in adopting the new technology as outweighing the potential benefits.
2. Innovations related to big data and predictive analytics hold significant opportunities for energy companies. Nonetheless, adoption is difficult because sometimes the IT/OT layers of the organization have not been effectively integrated and data quality has been compromised by manual entry.
3. Many organizations are experimenting with lots of so-called "new toys," but often these point solutions lack a wider strategic context. In essence, leaders haven't created a vision for the world that the technology needs to enable so these solutions often fail to be adopted and/or to produce the intended benefits.

Many innovations, whether involving new technologies or leveraging data analytics or redesigning the ways in which work gets done, will require a new approach to acquiring and developing talent. Successful implementation will demand different skills sets, new modes of collaboration and different teaming structures than can commonly be found within oil and gas companies today.

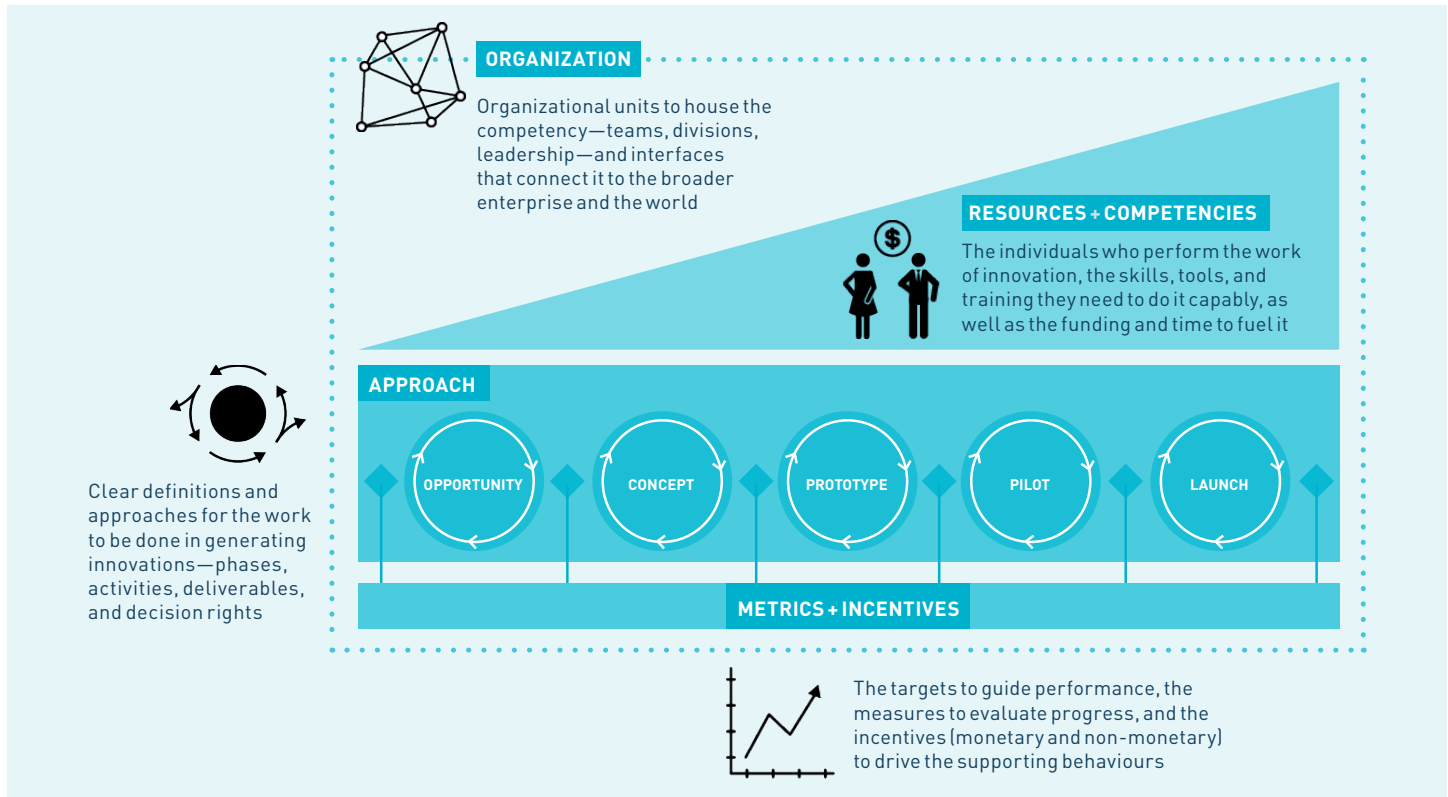
These are all enterprise-level challenges that need to be addressed. Employees know that innovation is important and that it should be central to leaders' agendas. Yet, the reason organizations don't get the traction they desire is because they have failed to methodically build the organizational systems, capabilities and metrics to become serial innovators. It's the boring stuff, but it's the crucial stuff!

In order to reliably deliver the kinds of innovations required to enhance shareholder value and outperform the competition, leading companies typically exhibit capabilities across four key building blocks (see Figure 4). Furthermore, each of these four building blocks is associated with specific capability levers (12 in total) that any organization can emphasize or adjust to ensure they can consistently and continuously identify, develop, and deliver new value to their customers.

A closer examination of how successful innovators use the building blocks and capability levers suggests:



Figure 4. Innovation building blocks



1. They employ a tailored **Approach** built around clear definitions and methodologies for the work to be done in generating innovations—phases, activities, deliverables, and decision rights. Rather than just state that innovation is important, these companies have developed an innovation strategy that crystallizes what their innovation ambition is, where they intend to focus, and what value they aim to derive. Furthermore, they have devised a plan for taking an idea from concept through to commercialization, and they manage their innovation efforts as a portfolio across Core, Adjacent and Transformational innovations. On this last point, very few organizations have created an enterprise view of their innovation portfolios against which they can make capital allocation decisions. The capability levers associated with this building block are innovation strategy, pipeline/ portfolio management, and process.
2. They have structured the **Organization** to house the innovation competency (i.e., teams, divisions, and leadership) and established interfaces for connecting it to the broader enterprise and the world. This starts with a clear mandate from senior leadership—without it, innovation will become a skunk works project with little hope of getting traction among middle managers. Furthermore, leading innovators put the governance systems in place to manage innovation as a portfolio, both internally and externally. The capability levers associated with this building block are senior leadership, governance and collaboration.

3. They acquire and nurture the appropriate **Resources and Competencies**, i.e., the people who perform the work of innovation; the skills, tools, and training they need to do it capably; and, the funding and time to fuel it. This means investing in the human resources and tools necessary to support their innovation portfolios. Innovation cannot be sustained without capital; yet many companies fund their innovation efforts from their operating budgets and seldom have a comprehensive picture of the total innovation funding across the organization. Additionally, very few organizations have aligned their talent systems with their innovation agendas. The capability levers associated with this building block are funding, talent management and innovation tools.
4. They have developed the right **Metrics and Incentives** with targets to guide performance, measures to evaluate progress, and incentives (monetary and non-monetary) to drive the supporting behaviors. Metrics and incentives are critical to driving the type of innovation behavior that organizations seek, and they often involve recognizing employees for their contributions to innovation, both through financial and non-financial rewards. Accordingly, metrics are necessary for tracking innovation activity throughout the internal and external ecosystem. The capability levers associated with this building block are financial and non-financial rewards, innovation metrics and external attraction.

Put simply: with the right use of these building blocks and capability levers, organizations can innovate more systematically and drive consistently higher returns from their innovation investments.

## INNOVATION IN ACTION

*Based on the concept that delivering shared value will maximize shareholder value, **Anglo American** envisions its future as that of a development partner—with shareholders, communities, the environment, and complementary companies. To achieve these goals, it has adopted an integrated planning approach focused on building the right portfolio of assets, putting the right people in the right jobs, and creating the structure and capabilities to perform at the highest level. The overall concept is to generate long-term sustainable value for all stakeholders by using innovation as an integral part of the strategy to drive the step change transformations required to conduct business in today's changing environment.*

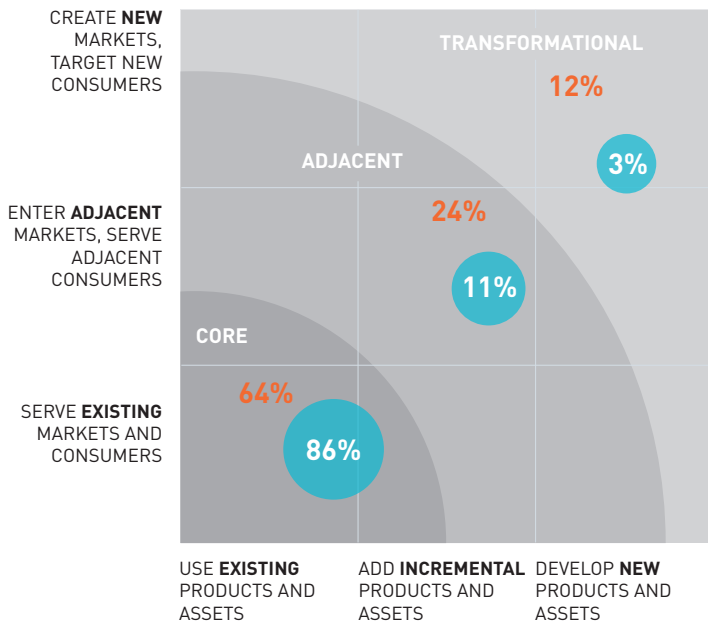
Sources: Anglo American 2014 Annual Report and <https://www.youtube.com/watch?v=pqJNxZIkYS0>

# 02

## Oil and gas state of play

Across the board, innovation ambition is focused squarely on the Core ambition horizon, with a strong emphasis on technological solutions to optimize old techniques “as needed.” Innovation for study participants, in other words, is mostly a means to an end, either (1) reducing costs or (2) finding better ways to increase production. The results show that 86% of current innovation is targeting Core-level ambitions, with 11% in Adjacent and only 3% in Transformational. Most companies however cited the importance of investing more into Transformational (12%) and Adjacent (24%) efforts in the future (see Figure 5).

Figure 5. Innovation ambition matrix



### INNOVATION AMBITION HIGHLIGHTS

Innovation focus has been on the **Core** innovations with a strong emphasis on technical solutions to optimize old techniques “as needed.”

Innovation is commonly interpreted in two ways across the industry: 1) reduce costs and 2) find a better way to increase production. Both are Core innovation examples.

Less integrated companies often have difficulty spreading their risks and are less likely to adopt **Adjacent** and **Transformational** innovations in-house, but may be successful through an external ecosystem.

TARGET INNOVATION INVESTMENT DISTRIBUTION

CURRENT 2015 DISTRIBUTION

Respondents report feeling urgency to drive more Adjacent and Transformational innovation, but have a difficult time spreading the risk. Or, put another way, a low risk appetite gets in the way. Notably, developing better external collaboration networks for innovation is seen as a way to overcome that barrier. In the last few years, collaboration ecosystems have proliferated. Some utilize more localized collaboration organizations such as Canada’s Oil Sands Innovation Alliance (COSIA) and Phoenix, while others employ more global structures that involve governments, a broader spectrum of industry players or the parent organization.

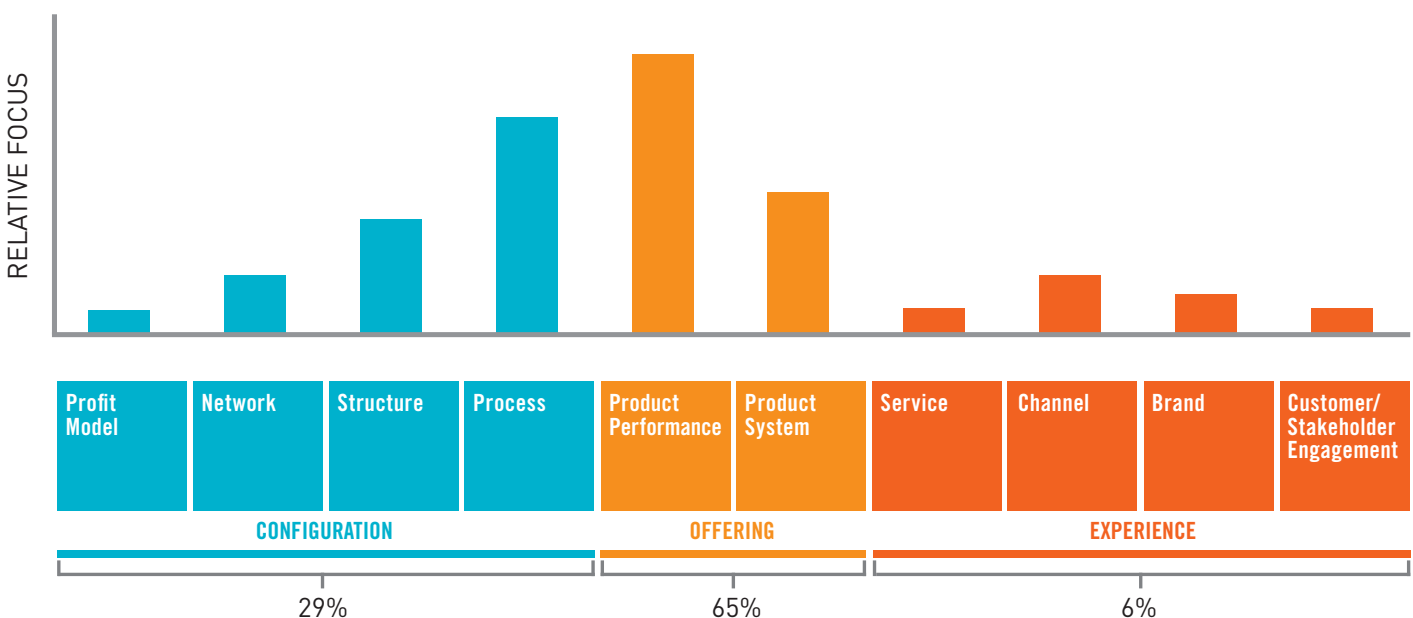
Broken out into the various types of innovation, approximately 65% of the combined 23 innovation initiatives reported among all respondents were in the Offering category, with about 44% of those specifically in product performance: technology and methods for better, cheaper production (see Figure 6 for a more detailed breakdown). This finding is not surprising considering that innovation

ambition among companies is generally centered on R&D and technical enhancements. However, focusing mainly on product-focused, Core-level activities does little to address the industry’s “critical juncture,” or the pressing need to pursue innovation broadly and systematically.

Companies today are typically focused on operational excellence, often in the form of incremental improvement. Study participants perceived their organizations to be too narrowly focused on incremental change, and not making bold enough changes through their continuous improvement programs. Doing the same things better will no longer be enough, especially for Alberta-based companies which need to move down the supply cost curve to become globally competitive, while simultaneously minimizing environmental impact and delivering better social value.

Simply stated: it will be necessary for companies to look beyond product innovation in order to achieve more Adjacent and Transformational advances, which offer the greatest return on innovation investment.

**Figure 6.** Focus of oil and gas innovation

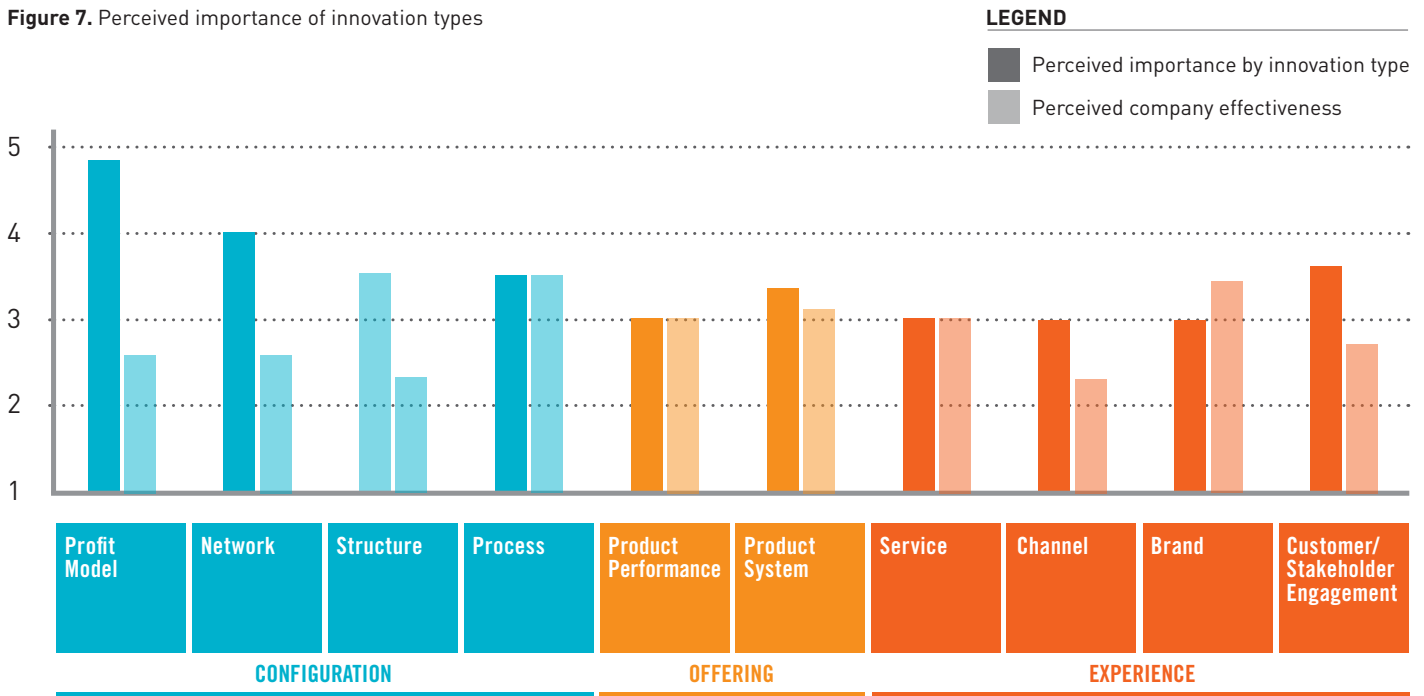


Where should companies focus when looking beyond product-centered activity? Respondents identified “Configuration” as the most important category to drive competitiveness, which also had the largest gap with current performance. Respondents additionally perceived the “Experience” category as just as important, if not more so, than the Offering category for driving competitiveness, since it largely influences the social license to operate (see Figure 7). We should expect the regulatory and stakeholder environment to increase over time, as evidenced with the recent COP21 outcomes, the renewed focus on climate change by Canada’s new government and increasing power of stakeholder networks, which are exerting their influence on corporate agendas. As a result, executive teams are focusing more intensely on the triple bottom line. Companies will need to innovate in order to create more shared value and earn their social license to operate, as well as secure market access which is a critical issue for Alberta. These objectives are mostly driven out of “Experience” category. The “Configuration” category can also help by providing new avenues for improving profitability, other than the typical productivity enhancements offered by technical departments.

### ***A NOTE ON OPERATIONAL EXCELLENCE VS. INNOVATION***

Operational excellence is focused on the day to day operational component of the business; to implement improvement and change in the organization’s processes, systems and people, while maximizing value of the life of an asset. The focus of operational excellence is a hybrid of cost containment, operational throughput and a stable work force. Operational excellence is a stand up example of how companies innovate within the core of the ambition matrix, to improve on their current day to day business activity. By definition, the Core innovation is doing stuff the business already does but doing so better. While innovating in this core is of critical importance to any business’ innovation portfolio, the higher returns will come from Adjacent and Transformational innovation. For oil and gas, this means expanding innovation beyond R&D and technical, into finding new ways to create superior value for the business and stakeholders.

Figure 7. Perceived importance of innovation types



## INNOVATION IN ACTION

*In the late 1990s, the media revealed that Ontario’s nuclear power plants ranked among the worst in the world on operational safety evaluations—the public was outraged, and scared. In order to succeed, the new operator, **Ontario Power Generation**, would not only have to demonstrate to the public that it was a responsible operator but also that nuclear power could achieve triple bottom-line results better than any other source of electricity generation. Through operational excellence, and innovative new approaches to governance and transparency, the company achieved these goals, helping to transform the perception of nuclear power from a dirty and dangerous energy source into a “green” and sustainable one.*

Sources: [http://nuclearsafety.gc.ca/eng/resources/canadas-nuclear-history/html/info\\_historical.cfm](http://nuclearsafety.gc.ca/eng/resources/canadas-nuclear-history/html/info_historical.cfm), [www.wano.info](http://www.wano.info), [http://www.ccnr.org/news/news\\_briefs\\_98.html#table](http://www.ccnr.org/news/news_briefs_98.html#table), <https://plus.google.com/104173268819779064135/posts/Vs6Csiv1xYr>

## State of oil and gas players

Oil and gas companies are united in the growing awareness that they must get serious about innovation. They are also united in the challenges that are preventing them, and the sector as a whole, from acting on the innovation imperative in a concerted way. Across the board, respondents cited lack of collaboration, both internal and external, and tension between short-term and long-term goals both within and between organizations, as major obstacles. Additionally, they pointed to resourcing as a stumbling block to achieving their innovation objectives, with accessing talent being slightly more difficult than funding.

While respondents acknowledged that persistently low oil prices are contributing to these challenges, they don't see present-day capital constraints as the heart of the matter. Barriers to innovation, they assert, are fundamentally linked to the sector's risk-averse culture, which generally favors incremental change versus step change, and is rarely open to input from parallel industries.

One respondent, a senior vice president at an upstream integrated company, perhaps said it best: "We are suffering from a 'not-invented-here' culture. The industry has a view that anything developed outside of the oil sands does not apply . . . We tend to think we're special and different and so aren't open to learn from others, where in reality there is so much that would apply here."

Of course, changing this insular, risk-averse culture, and siloed nature of work where innovation happens in pockets, hinges upon changing the minds of senior leadership, who often lack a broad view of innovation, seeing it mainly in terms of technology development aimed at improving productivity. In fact, the organizational structure of most oil and gas companies exacerbates this view, with employees operating in deep functional silos. These silos often preserve and deepen technical expertise while only requiring cross-functional collaboration when absolutely necessary. As a result, oil and gas companies generally lack systematic processes, formal structures and internal incentives to foster collaboration across the enterprise and to solicit the input of external partners. This makes it incredibly difficult, especially for majors, to transform.

What's needed is a more coordinated environment in which companies can pursue all types of innovation across the three ambition levels and manage these efforts as a portfolio to mitigate risk. Very few companies actually have visibility into all the innovation initiatives across the organization and as a result don't manage this as a portfolio. This lack of visibility prevents them from making well-informed capital allocation choices across the portfolio. In addition to a more expansive view of innovation, the goal should be broader as well, aiming to create value across the triple bottom-line of cost, environmental impact, and the social license to operate. To minimize or remove the perceived barriers, oil and gas companies would significantly benefit from bringing cross-functional teams together to discuss, promote and foster innovation. They would also benefit from engaging external stakeholders to a greater degree.

External collaboration is happening, and companies generally perceive themselves to be good at it. But, it is mainly limited to oil and gas technology providers. Notably, several participants cited their company's inability, or even aversion, to seeking input from other sectors beyond the cross-industry exposure they get through forums such as COSIA. Even within the industry, companies are still in the beginning stages of working more systemically with the broader network of stakeholders and service providers to drive innovation. As one respondent, the innovation leader for sustainable development at an upstream integrated company, said: "We have no mechanics to allow service providers to show how they are innovating for us, or to involve them in our biggest challenges."

Siloed internal functions also pose challenges, with respondents reporting that little cross-functional collaboration is taking place. More structure, organization and support are required to help break down internal and external barriers to collaboration. This could be accomplished perhaps by implementing a sensing function to learn from other oil and gas players, including those outside the oil sands, as well as from companies in related energy and resources sectors, such as mining and nuclear, both of which have experience in managing challenges related to operations and public perception.

Furthermore, in Canada the federal and provincial governments may play an important role in promoting innovation through carbon pricing and other policies.

In Alberta, for instance, the \$15 price on carbon is set to more than double to \$40 per tonne by 2017<sup>2</sup>. According to the Canadian Association of Petroleum Producers, these funds will accelerate research and development and could lead to investment of more than \$1 billion over 10 years into technologies for reducing greenhouse gas emissions and creating other positive environmental impacts<sup>3</sup>.

While provincial mechanisms such as Alberta's carbon pricing could incentivize innovation, particularly among oil sands producers, Canada is still seeking to design and implement an effective innovation policy that explicitly sets out national goals and priorities. In the oil and gas industry, much of the necessary innovation requires large capital investment. Current support for innovation through tax incentives has been significantly reduced by federal and provincial policy changes (i.e., rate reductions). This makes it difficult to provide the right support to projects as they move through the innovation cycle from idea to R&D and, eventually, commercialization.

2) Canadian Association of Petroleum Producers, "Technological Innovation Key to Canada's Action Plan on Climate," November 20, 2015, <http://www.capp.ca/media/news-releases/technological-innovation-key-to-canadian-action-plan-on-climate>

3) *Ibid*



# 04

## Self-organization

Figure 8 shows the scale Doblin uses to measure the extent to which companies have integrated innovation into their organizations—their relative *innovation maturity*. Scoring low on the scale (1-2) suggests innovation efforts that are highly random, haphazard and lacking discipline—characteristics of a novice. At the other end of the scale (5-6), companies have become truly excellent innovators, demonstrating adaptive capabilities that are ingrained at their organizational cores and supported by refined innovation systems.

The Deloitte study revealed innovation capabilities within oil and gas companies generally range from sporadic to competent, averaging a 2.9 on a six-point scale, with six being the highest. As a point of reference, the mining industry averaged 3.4 on the same scale. Although there was a significant spread in

results, all oil and gas companies have some distance to go before their innovation capabilities can be considered excellent or leading-edge.

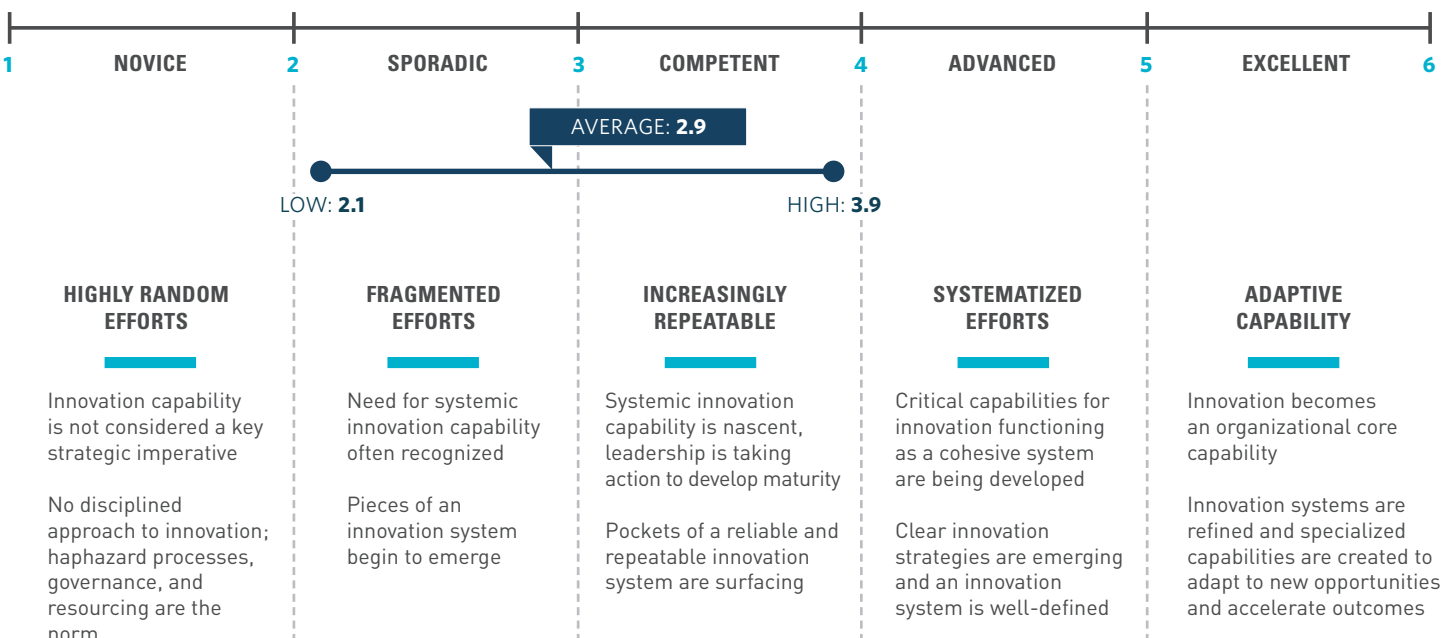
The 12 innovation capability levers are also scored on the maturity scale (see Figure 9). On those terms, the sector shows particular strength in innovation strategy, pipeline & portfolio management, and external collaboration, and it has the furthest to go with cross-functional collaboration, funding and metrics. In aggregate, we discovered some interesting weaknesses and strengths across the organizational building blocks:

### APPROACH (Average maturity score: 3.0)

The innovation imperative remains unclear throughout the sector and is not collectively understood. Most respondents felt that they knew which innovations

Figure 8. The industry's maturity scale

Scale of 1–6 (low to high maturity)



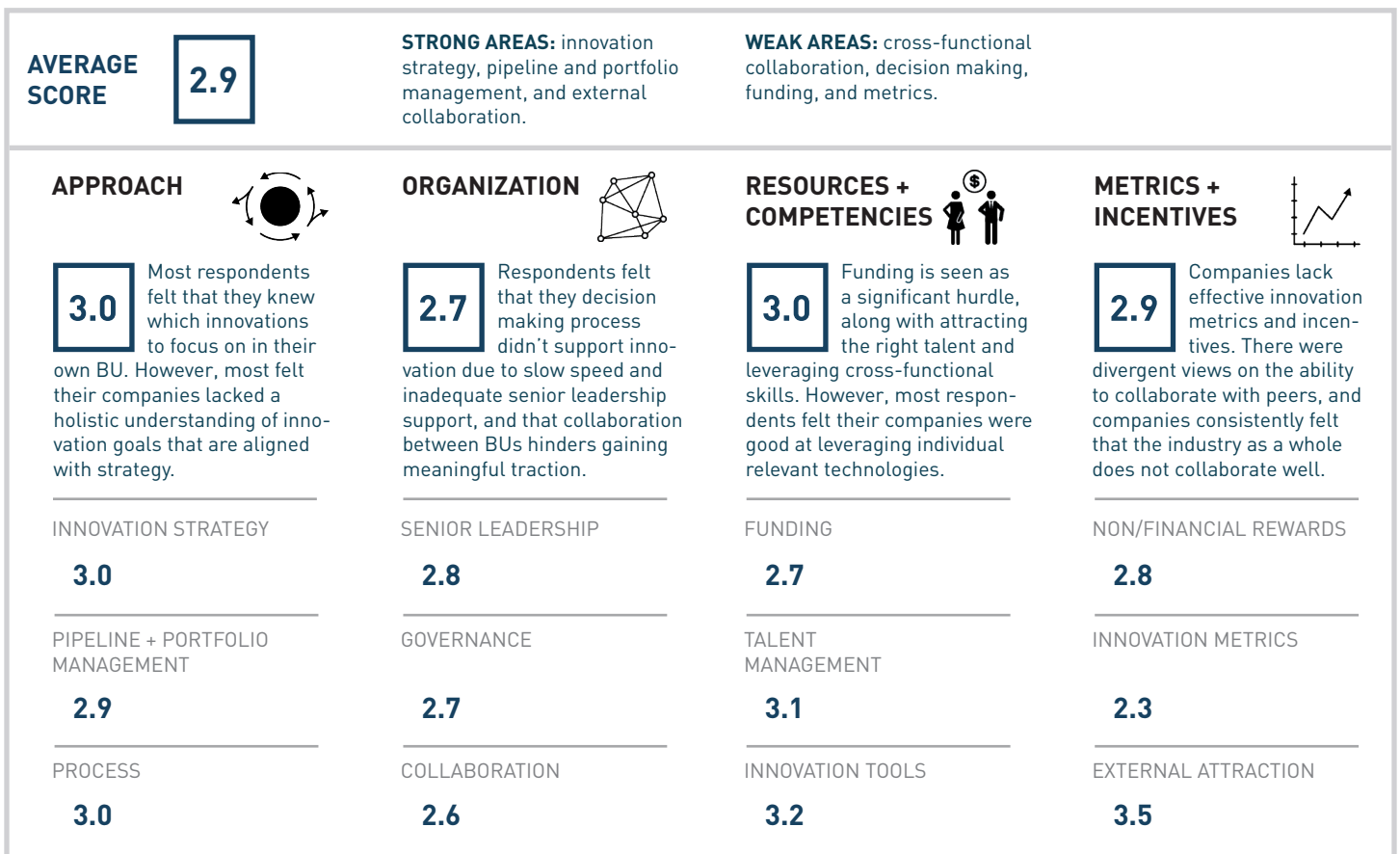
to focus on in their own business units; however, they believed their companies lacked a holistic understanding of innovation goals that are aligned with strategy. They also indicated that regional innovation priorities are not well understood by corporate head offices, which may be located in the US or internationally. This can be problematic since the needs of unique regional assets such as the oil sands can differ dramatically from those across the rest of the company. Overall, innovation is more often than not uncoordinated, fragmented, and performed in silos, with no integrated portfolio view across the enterprise. A disciplined approach to collecting ideas or defining processes for developing, launching, and tracking innovation investments is lacking.

**IN YOUR OWN WORDS**

*“Our strategy is loose—we throw ideas at the wall and see if they stick.” —EVP local subsidiary NOC*

*“The local leadership team knows that it’s more important than ever to drive innovation [in oil sands]...however, the global purse-string holders see things differently.” — Local Director, Global integrated player*

**Figure 9.** Maturity of innovation building blocks and capability levels



## ORGANIZATION *(Average maturity score: 2.7)*

Although they usually had the right stakeholders involved in innovation decisions, most respondents believe that decision-making processes generally do not support innovation. Formal governance structures to enable innovation are too often missing and decision-making is therefore frequently slow and fragmented. Poor collaboration across functions, including field operations as well as engineering and technical services, emerged as a particular weakness. Respondents also expressed frustration with inadequate senior leadership support, particularly with Transformational and Adjacent initiatives. Still too many senior leaders believe that innovation is all about managing costs through operational excellence, and thus give most of their attention to product-focused, Core-level ambitions. Considering this widespread view, it is not surprising that “operations” was most commonly cited as having the strongest innovation capabilities.

### IN YOUR OWN WORDS

*“Getting the organization to coordinate well is a challenge.” — VP International Oil Company*

*“There are a lot of frustrated people in our organization who are trying to drive innovation but they’re not gaining traction. They’re waiting for leaders to acknowledge and help them drive what they’re trying to enable.” — Director Strategy, Integrated Oil Company*

## RESOURCES AND COMPETENCIES

*(Average maturity score: 3.0)*

Access to funding for innovation is a significant hurdle for oil and gas companies, and it often competes with operational budgets. In addition, respondents consistently mentioned access to internal talent as an equal, if not greater impediment. Dedicated resources are generally lacking, as is a centralized view for innovation to be managed as a portfolio. Overall, most respondents felt their organizations aren’t adequately attracting the resources and developing the competencies for innovation, nor are they tapping cross-functional talent from across the organization as needed. Most respondents, however, perceive their companies to be good at leveraging relevant technologies.

### IN YOUR OWN WORDS

*“It’s hard to bring down both environmental impact and costs.” — VP International Integrated Oil Company*

*“Alberta is still a very young market and companies are barely getting out of startup mode. [But,] they really need to professionalize now.” — VP Sustainability International Oil Company*

## METRICS AND INCENTIVES

*(Average maturity score: 2.9)*

Respondents reported that innovation metrics are under-developed and poorly integrated with overall management metrics in most organizations. Indeed, scores concerning innovation rewards and metrics were notably low. Often, companies lack the process discipline to develop strong business cases for their innovation efforts, and there is no systematic approach to making trade-offs, whether between long-term versus short-term goals or across the triple bottom-line. Without proper incentives and a way to differentiate between day-to-day responsibilities and innovation activities, managers have little motivation to pursue initiatives that carry higher risks and rewards. In contrast to the lack of innovation metrics and incentives, most respondents report having good external collaboration, although they indicated there was room to improve in capitalizing upon third-party relationships by defining a clearer strategy regarding what they wish to achieve through them.

### IN YOUR OWN WORDS

*“We need to be clearer on which dials we want to move specifically; what technologies we can adopt that will move those dials; and what doesn’t exist that we need to develop.” — VP Technical  
International Integrated Oil Company*

*“I think Alberta is beginning to get much better at collaborating now between academics and industry players.” — VP Strategy, Integrated Oil Company*

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## Coming of age in an age of disruption

It can be tempting to think of innovation solely in terms of products and technologies. Indeed, it's now widely accepted that exponential technologies—Big Data, IoT, 3D printing, wearables, etc.—will disrupt how most sectors operate. And oil and gas companies can also add rising environmental concern and associated activism to their list of pressures. But whether it's the emergence of a new technology or an updated way of using an old one, companies are encouraged to embrace three key principles:

1. Be explicit about your ambition and vision for innovation. Only then can you effectively organize and execute.
2. Look beyond product innovation to develop, launch and de-risk new offerings.
3. Build the capabilities of an innovation *discipline*—because innovation almost never fails due to lack of *creativity*.

More specifically, oil and gas companies may wish to consider these recommendations for enhancing the overall effectiveness of their innovation cultures:

### **Set the tone**

Innovation needs to be driven from the top and shouldn't be a middle-management skunk works. More generally, leadership must give direction, empower people, and provide focus in order for the organization to drive innovation. People need to know what's important, and that leaders value them and their innovation efforts. They also need to have clear metrics and goals for what can be achieved in the short term and in the long run.

Leadership should also create a “no excuses” mentality, where problems are approached in terms of how a potential solution could work as opposed to why it can't work now.

### **Link initiatives together**

A disconnected approach rarely works. Successful innovators manage a portfolio of initiatives across Core, Adjacent and Transformational ambition levels, and they have a clear capital allocation strategy for dispensing the funding. They also have a clear vision for enhancing and integrating operations along the value chain, including short-term, mid-range, and long-term milestones for realizing that vision. Today, most companies tinker at the edges of their operations through short-term initiatives. Instead, link each initiative to achieve your 5-, 10-, and 15-year goals.

### **Enable your organization**

Ensure your innovation efforts are adequately funded and supported with the right resources and capabilities to deliver. Equip your people with the right tools to share their ideas and move innovation forward.

### **Leverage what has worked elsewhere**

Look both within and beyond the oil and gas sector. Someone somewhere has dealt with a similar problem before. To do so, create an opportunity team, then roll out in small but rapid deployments versus one “big bang.”

### **Think beyond just R&D and operational excellence**

Assess how you collaborate on common issues with a wider set of partners, including internal groups (e.g., government relations, First Nations relations, sustainability, HSE compliance, etc.), service companies and even competitors.

Finally, companies need to understand how to make trade-offs between the societal, economic and environmental value they are generating. They also need to know which operational levers are fundamentally driving this value. All too often, societal and environmental goals are detached from operations and are perceived as being driven from some other part of the organization.

Success, after all, is about thriving, not merely surviving. In a down cycle specifically, that means adapting to an increasingly complex and challenging operating environment. But, any one company can only achieve so much. Considering the magnitude of the environmental, social and economic pressures facing oil and gas companies, the industry will collectively succeed or fail in withstanding them. This raises the value of innovation to new heights. Through innovation, leading organizations have an opportunity to build a new brand for themselves as well as to redefine the perception of the industry. This new image will need to encompass not only economic benefits but also environmental protection, stakeholder engagement, safety and the social license to operate. Taking an integrated approach to innovation across the enterprise, and collaborating with stakeholders within and outside the industry, may well be the only way to bring about this paradigm shift.

For the oil and gas sector, utility is strength in making the great strides necessary in so little time. ■

## FOR FURTHER READING

### ***Innovation in Mining: Canada 2015***

Innovation is critical to success and growth at a time when the mining industry is at crossroads. How can majors, juniors and service companies successfully navigate the downturn? PDAC and Monitor Deloitte examine the strategic, organizational, financial and performance requirements to develop and support an innovative environment within companies. Download the report [here](#).

### ***Pipeline 2020***

These are challenging times for Canada's midstream oil and gas sector. *Pipeline 2020* is about the much-needed radical technology transformation that will allow the oil and gas sector to sustain economic growth while improving operations and strengthening the social license to operate. The data-driven pipeline will become a competitive imperative. If companies can make one or more of four strategic "moves," they will stand a much better chance of sustaining economic growth. What moves will you make? Download the report [here](#).

## ABOUT

### **MONITOR DELOITTE**

To grow with confidence, organizations need to make clear choices about where to play and how to win. And in a world where the pace of change is rapid and sometimes unexpected, leaders need to act nimbly and decisively. Monitor Deloitte strategy consultants employ cutting-edge approaches embedded with deep industry expertise, working with leaders to resolve critical choices, and drive enterprise value.

### **DOBLIN**

Doblin is a global innovation practice deeply committed to helping clients innovate with confidence while advancing the frontiers of strategy and innovation leadership. Doblin possesses an ever-evolving set of multi-disciplinary capabilities and diverse perspectives, which are effectively integrated in highly collaborative teams and client programs. Taking a user-centric approach, Doblin practitioners combine design, research, and strategy expertise to help organizations innovate more boldly and effectively.

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