

REPRINTED FROM

OIL & GAS MONITOR

DECEMBER 14, 2015

WWW.OILGASMONITOR.COM

OIL AND GAS INDUSTRY MOVING FORWARD

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Oil and gas industry participants don't know whether to be happy or sad to see 2015 wind down, even though it was a bad year. As bad as it was, apocalyptic predictions for massive bank redeterminations that would send firms into bankruptcy or force them to sell at fire-sale prices didn't happen. But what does it say when avoiding bankruptcy is the good news?

We enter 2016 with a general consensus that "lower for longer" must be endured. Management teams have cut spending dramatically. Will that be leadership's only tool for 2016? What about the majors whose defense of their dividends is beginning to look unsustainable?

China, which has for so long provided demand growth, is slowing. In fact, many say the deceleration in China is much bigger than revealed, and this will become clearer in 2016. The Fed's anticipated action is a key force in driving the dollar up and likely driving oil prices down. It's not clear that 2016 is going to be better than 2015; some suggest it will be worse—potentially much worse.

This article summarizes how the industry will move forward. It is as much prescriptive as predictive. The bottom line: The industry will emerge from this tunnel of doom, and glimmers of light pointing the way can be seen. The way isn't illuminated by hopes for higher prices, although prices will likely see some relief starting in late 2016 and accelerating in 2017. Likewise, the establishment of an "Energy Policy" will not be our guide. The way forward is the relentless pursuit of innovation by getting more for less, finding high-value niche solutions, and establishing new business models that bring customers closer and create collaborations.

Here are our recommended New Year's resolutions for oil and gas industry leaders and their organizations.

Get "agile," not "lean"

Unconventional resource development in North America has changed the world while crushing commodity prices. The common mantra that this is a technology-driven disruption misses the equally important, but less discussed, business process revolution associated with managing this disruption. The proof of this revolution can be found in the gains wrought by "manufacturing learning." We use this term deliberately to highlight that the levels of improvement seen in unconventional operations mimic other industries like aerospace construction, shipbuilding, and electronics. Every time the number of wells in a particular play doubles, performance (IP, drilling days, EUR)

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should improve by at least 10% and overall return by 20%. Think of this as Moore's Law for unconventional resource development. If your operations follow this law, you win. If not, you lose.

These improvements should not be conflated with the reduced costs of services captured by operators, because the market is so tough because these gains will reverse when activity ramps up. Likewise, manufacturing learning isn't driven by "lean manufacturing" tools that strive to minimize deviations from standard designs and eliminate waste to reduce cost. Rather, these business processes are more akin to "agile" methods used in high-tech industries like software development, where success comes through designs that evolve, sometimes rapidly.

Oil and gas management teams can ensure their organizations build the capabilities needed to learn by adopting agile approaches. If they don't, they likely will not find their way through these tough times.

Make new friends

Collaboration trends continue to evolve. Innovative business models need to look beyond traditional operator/non-operator parties or operator/service provider relationships. One example is the evolving trend of regulated utilities acquiring natural gas reserves and production. Deals have already taken place, and large regulated utilities and their PUCs have expressed additional interest. These regulated utilities see benefits for customers in these deals, chiefly reducing the volatility to natural gas prices. This is particularly important because the generation mix is becoming more gas dominated with or without the EPA's contested Clean Power Plan. On the other hand, operators could benefit from a new source of financing that focuses on the long term. The challenge is to ensure that risks are equitably shared so the deals can gain PUC approval. Early indications suggest this will require flexibility by all parties; however, operators confident of their ability to achieve manufacturing learning (see above) can provide solutions to utilities acting as non-operating working interest parties that provide the type of assurance PUCs require.

Other examples of innovative collaboration exist but require that management rethink traditional relationships and "partners." Non-traditional risk sharing (i.e., going beyond price protection) will be necessary, but this is the core competency of leading operators.

Become more flexible, not bigger

"Mega" is so '90s! Nobody can criticize the oil and gas industry of thinking small. Individual projects rival the NASA Apollo program in complexity and cost. These mega-projects began partly in response to the majors' growing restrictions to resource capture in favor of NOCs. Tremendous efforts to build capabilities to manage these endeavors (e.g., state-gate processes, decision analysis) initially paid dividends; however, even before the Great Recession, performance suggested industry had likely bit off more than it could chew. Costs were rising much more quickly than prices; when commodity prices fell, many projects became tenuous at best. Had money not been so cheap, the damage would have been catastrophic. However, it is likely that about half of the projects that were pre-FID before the drop in oil price will be delayed until at least 2020, if not abandoned altogether. This means that over \$150 billion a year of spending will come off the table.

Ultimately, the problem with these mega-projects wasn't size. Rather, these projects were—from an investment perspective—very inflexible. They can't really be slowed, accelerated (although many tried), or scaled. You either do them or you don't. Unconventional plays are just as big but are very flexible. We've already seen how they can be accelerated (boom in rigs) and slowed. The current "high-grading" demonstrates that they can be scaled. This flexibility provides substantial financial advantage.

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In 2016, industry winners will begin the process of making the conventional side of the business more like the unconventional by finding truly flexible solutions. The real value of this flexibility can be—but currently is not—included in investment decisions. This will change. Modularization, joint-developments, and other examples exist but have been pursued haphazardly or forced by regulators. “Small-scale” floating LNG (“FLNG”) like Perenco’s Kribi project has greater flexibility than massive LNG projects, and more FLNG is expected.

Flexibility and agility are similar but as used here are different concepts. Agility in unconventional plays involves rapidly changing the basic elements of well design (including completions) to drive manufacturing learning. Flexibility, as used here, refers to investment flexibility or optionality.

The transformation of the conventional upstream business to become more flexible and thus more like the unconventional business is especially critical to the majors who have not demonstrated they can capture the prize of unconventional plays and are still plagued by conventional resource-capture challenges.

Conclusion

Leadership will differentiate firms. Successful leaders of firms competing in unconventional resource development will ensure their firms continue to get more with less by building the capabilities to be agile to drive manufacturing learning. To find value-adding collaborations and draw closer to customers, leaders must build new business models and find new relationships. Finally, the older conventional E&P business has a lot to learn from the younger unconventional business about valuing and exploiting investment flexibility. Leaders of successful conventional businesses will ensure their organizations change to capture these lessons. We’re confident that leaders will rise to these challenges and that we will soon see the light at the end of the tunnel.

The views and opinions expressed in this article are those of the author and do not necessarily reflect the opinions, position, or policy of Berkeley Research Group, LLC or its other employees and affiliates.

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Gardner W. Walkup, Jr. is a global energy executive, innovative strategist, trusted advisor to corporate management and boards, and energy expert for law firms, industry clients, and regulatory agencies. He has developed and implemented strategic transformations and led the alignment of corporate culture and competencies necessary to implement these strategies. He has a deep understanding of the energy value-chain, from land acquisition and exploration through power distribution and energy marketing. He brings a keen understanding of geopolitical, economic, commercial, operational, and technical risks, as well as experience in over 30 countries representing capital investments of more than \$300 billion.

As a corporate executive, Mr. Walkup has chaired an Investment Committee directing overall corporate capital allocation, led the development of a new corporate strategy that drastically narrowed investment focus and reduced costs, and led the design and implementation of culture change and capability building efforts in response to new strategies and major acquisitions.

Mr. Walkup is a recognized expert in energy asset valuation and mega-project management. He has advised corporate boards and executives investing globally in unconventional resource plays, including shale gas, tight oil, and coal-bed methane, and investments in global mega-projects with capital requirements of more than \$5 billion. He has significant experience in LNG and deepwater development. In addition, Mr. Walkup has advised corporate leadership on portfolio management, transaction support, business-unit growth strategies, and project management leadership capability building.

Mr. Walkup's expert advisory experience includes significant international litigation and arbitration matters concerning industry practices in mega-project development, offshore operations, and operating/non-operating party industry best practices.

Mr. Walkup started his career at Chevron, where he served as senior reservoir engineer for a 250,000-barrel-a-day oil field in Indonesia, led strategic planning and petroleum engineering for a major offshore Gulf of Mexico development, managed a corporate project to improve economic valuation methodologies of large capital projects, and developed novel reservoir-characterization approaches.

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