

Mature Fields Strategy: A Framework Approach to Matching Resource Class and Technology Portfolio

Surya Rajan, IHS Cambridge Energy Research Associates, Houston, Texas USA

surya.rajan@ihs.com

and

Paul Markwell, IHS Cambridge Energy Research Associates, London, United Kingdom

paul.markwell@ihs.com

Summary

Access to new reserves is a fundamental objective for oil and gas operators. This drives the industry to explore in ever more challenging frontier areas to achieve long term growth. Yet there is a significant prize right on the industry's doorstep, through reserves growth in existing and mature fields. The key to unlocking this potential is through the application of new and innovative technologies and recovery techniques. Indeed, in recent years there have been examples internationally where reserves growth has outpaced new reserves identified through conventional exploration drilling. The implication for companies is that to achieve growth they have choices in how they manage the balance of their capabilities for exploiting existing resources or finding new ones.

Introduction

Reserves estimates are updated over the course of the life of a field, resulting in an effective gain or loss of reserves. Some updates to reserves are simply an artifact of updated information, such as late reporting of discoveries, availability of better scouting information, or reclassification of the hydrocarbons. But IHS CERA research suggests that on aggregate reserves grow significantly during the life of a field through further appraisal, infill drilling, redevelopment, completion of new zones, better reservoir management, or better exploitation through improved or enhanced recovery techniques.

Theory and/or Method

Simple calculations illustrate that if oil price and cost differentials would remain broadly in line with those of today, then further application and development of technology has potential by the middle of this century to unlock reserves growth in and around already discovered oil and gas fields on a magnitude of around 1 trillion barrels equivalent. This is a substantial prize – even comparable to global historical hydrocarbon production. But what makes this prize even more attractive is the fact that field upgrades and investments do not carry the same inherent uncertainties and risks as are associated with frontier exploration: the industry knows where those existing resources are located - they simply have to figure out how to exploit them. Of course, it is important to note that investments to grow reserves in mature fields do carry some important commercial risks even though these may differ from those associated with exploration.

A framework approach has been applied to identify key technologies essential for success in a mature assets portfolio.

Examples

There are many examples of unprecedented reserves growth in mature fields, such as EOR applications in Duri, Indonesia, and unconventional-style drilling and stimulation in the Granite Wash and Permian Basin plays in the US.

Conclusions

Mature fields clearly present a great opportunity, but success in mature fields also requires a very distinct set of characteristics.

- Contractual incentives need to be tailored to suit investment needs in mature fields.
- Operating in mature fields requires a different mindset.
- Early recognition of the true reserves potential would drive a more cohesive set of operating and investment decisions leading to better transitions in the mature phases of a field's life.

A framework-based approach helps operators, service companies, and investors better understand a comprehensive portfolio approach towards mature asset classes and corresponding technologies. Based on our studies there are two major findings relevant to operators seeking to position themselves strategically for future resource opportunities:

- Key technologies that affect the resource portfolio span imaging, digital technologies, sub-sea and EOR. To confidently exploit the potential from these technologies companies must focus on developing of skills and capabilities associated with those technologies.
- Besides reserves growth through application of technology, technical prowess in key areas is a core competency that can help position an operator as a partner of choice, thereby enabling access to new opportunities.