

# Cut the Costs of Hydrocarbon Accounting

A Focus on Performance Improvement



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# 1 Introduction

## 1.1 Background

The sharp drop in oil prices during 2015 has only served to highlight several longstanding problems with production data management in the Oil and Gas industry, including:

- Poor data quality and lack of data integration;
- Spurious data,
- The absence of a coherent data strategy, resulting in fragmentation and limited use of analytics;
- Unclear ownership of data across processes;
- Limited visibility of data across processes.

Often, these issues combine to create further problems across a number of disciplines, with broken workflows and poor corporate decision-making as a result. In practice, it makes it challenging to implement operational decisions in a timely and cost-effective manner, leading to an unstructured and disorganised approach to day-to-day field operations.

While these problems would ideally have been fixed when profits were high, the need for a fix is dramatically more urgent in the current low oil price environment. It is necessary to take advantage of opportunities to deliver results faster, with fewer resources, and with more flexibility.

Ultimately, profitability will increasingly be delivered on the back of improved and responsive workflows, effective knowledge management, the elimination of inefficiencies, and the implementation of real-time decision making.

## 1.2 Performance Improvement

Performance improvement is used as an umbrella term to describe a range of actions that allow companies to create an increasingly agile environment, delivering benefits to the business that are both clear and quantifiable. These actions include:

- Reductions in unnecessary spending;
- Maximisation of oilfield recovery;
- Elimination of non-productive time;
- Increases in profitability through the design and implementation of integrated workflows.

To achieve the above, we argue that companies must focus on five key operational areas, namely:

- Operational Efficiency
- Workflow Automation
- Production Optimisation
- Collaboration
- Data Integration and Decision Support

Combining each of these factors can result in dramatic bottom-line financial savings.

In this paper we will discuss each of these areas and, with reference to production data management in general, and hydrocarbon accounting in particular, we will provide practical solutions that oil and gas companies can adopt.

## 2 Delivering Process Improvement

### 2.1 Operational Efficiency

It's not just the oil and gas industry that is guilty of overlooking opportunities for operational efficiency when the tide is high and margins are large, but it is one industry that should be on the cutting edge in its application of technology. Companies that can produce at the lowest cost have always come out on top, and technologies that generate operational efficiencies should not be overlooked as part of that equation.

In today's environment, the focus is to do more with less. Oil and gas companies must:

- Create a business focus that is data and analytics-driven, and respond more quickly to changes in the business and technology landscape.
- Consider the low-hanging fruit: technology and process improvements that are quick to implement and have major impact without requiring dramatic change.
- Embrace new technology solutions developed specifically for oil and gas in order to increase ROI.

Implementation of the appropriate IT system can lead to a double benefit, involving a decrease in costs and an increase in efficiency.

As an example, consider production allocation and reporting. This is the heart of the oil and gas business, where a true understanding of the performance of the business is generated. Members of the business team, whether they be asset manager, production technologist, or reservoir engineer, are interested in ready access to data and the flexibility to make changes securely and with an audit trail. The solution for production allocation and reporting should be an enabler of change, not an obstacle. It should not require vast investment and significant specialist resources to implement and operate. It should dramatically improve the efficiency of the business.

However, traditional IT solutions for this critical function are often cumbersome, costly, complex to implement and change, and at the end of the project, not fit for purpose. Even so-called "standard" systems are unnecessarily expensive to acquire, maintain and upgrade, with clients paying for high-cost manpower to cleanse data, manage information, and to provide the necessary visualisation and reporting.

These costs are not simply high, but extremely unpredictable over the life of an asset, and provide a challenge for cost management in all companies, large and small. Despite the importance of this data, comparable in many respects with financial accounts, these problems have led many companies to adopt spreadsheets as the repository for data. This leaves business-critical information in a hard-to-audit, easily corruptible file, with limited opportunities for scrutiny and secure information sharing.

The customer experience with the EnergySys Platform is entirely different. As an example, an operator acquiring interests in some mature assets required a modern, flexible solution for production allocation and reporting to replace a legacy traditional system. After selecting EnergySys, a major new system was implemented in less than three months, with the work largely undertaken by two hydrocarbon accountants within the client's organisation.

Furthermore, on average, customers using EnergySys have improved their operational efficiencies by 75% or more, utilising their resources on more strategic initiatives. This can translate into substantial revenue for organisations.

## 2.2 Workflow Automation

Workflow automation can reduce the stress on resources, enable consistency and control, and deliver significant cost savings. Aside from the immediate and easily quantifiable saving associated with a reduction in resource requirement, there are significant consequential benefits.

People regularly undertake routine, low-value, low-level tasks because it is “simpler”, or “quicker”, or because training or recruiting someone, or implementing an automated solution, would be “too expensive” or “take too long”. In truth, this is frequently encouraged by companies who impose stricter controls on expenditure than they do on the wasteful utilisation of days of staff time. Automation removes this by eliminating routine tasks and by freeing up resources to focus their efforts on more productive pursuits.

For one of our customers with a large number of non-operated assets, the task of collating data received daily from multiple different operators, in multiple different spreadsheet formats, was formidable. It required a week’s work every month for the hydrocarbon accountant to collate and validate the data. After implementing EnergySys, with data uploaded and imported automatically to the server, the monthly task was reduced to two hours.

There is also the issue of data quality to consider. Having consistency of process with defined validation rules, combined with a comprehensive audit trail and version history, can help avoid costly mistakes. When issues do occur, high quality data and reporting can save a company months of manual investigation, and even help avoid government fines. Reducing manual intervention also helps to decrease the time required to train a new person in the use of systems.

In essence, automation has a huge impact on performance improvement, ultimately leading to cost-savings from reduced personnel costs and a focus on higher value work. From our experience, this is particularly true for managing non-operated data and corporate consolidation, where a large amount of cut and paste of incoming data is involved.

While it can be difficult to assign a definitive figure to the cost savings, based on our experience it is likely to be significant.

## 2.3 Production Optimisation

When the oil price is low, increasing production may actually be harmful, prolonging low oil prices and increasing losses for individual companies. The key is to optimise to reduce unit lifting costs and increase profitability on every barrel.

Oil and gas companies now have access to more data, faster than ever before. Most importantly, with this readily available data, oil and gas operators can learn more about their assets and translate the information to optimise production, and reduce downtime, unplanned maintenance, and other operational costs.

By utilising mobile devices and cloud technology, companies have greater flexibility and control over their assets. This ultimately translates into more efficient output, better use of assets, and improved decision making. These ideas are not new. EnergySys has been delivering cloud services for over seven

years, but it's only now the oil and gas industry is on the cusp of a revolution in data management and application provision. However, more needs to be done to step away from the tired, rigid, comfortable software and processes of the last 20 years.

Without appropriate systems, companies could be facing late warnings of production issues, not to mention poor quality data which can directly give rise to deferrals. Deferrals or losses impact performance, and deferred production might not be recovered until the end of field life, or might require enhanced recovery investment.

When thinking about optimisation, it is not just availability of data that's important, but timely availability. As an example, with many onshore US assets an operator might only know the accurate figures for the production from a group of wells when he receives his statement from the buyer. This might be up to two months after the production day, which gives no opportunity for a prompt intervention to remedy problems.

All this can be avoided by implementing the right technology. Flexible, secure access to data from anywhere at any time, combined with advanced analytics, is easier than ever.

Furthermore, cloud technology does not require massive initial investment, which is a key challenge right now. As an example, the EnergySys Platform is highly configurable without any programming, and it is extremely quick and easy to set up. The subscriptions themselves are based on the figures for asset production, which creates a direct relationship between the payments for the service and the asset's unit lifting costs. This is a model well suited to the volatile nature of our industry, accommodating rapid expansion and contraction in the most cost-effective way.

## 2.4 Collaboration

There are many barriers to collaboration, some of which are a reflection of company cultures and some of which reflect the prejudices of individual workers. However, eliminating technical obstacles is a key step that nullifies many of the common objections. Creating and maintaining centralised data that can be stored and shared securely amongst employees is key. It is here that cloud computing offers an ideal solution, primarily due its accessibility, ease of use, and management capabilities. Information can be accessed at any time, in any place, by any person with the assigned authority to do so: all they need is a web browser and a secure login. This is unsurprisingly viewed as a significant advantage among operators with several locations across a variety of time zones, and our clients have told us that they have seen significant improvements in productivity as a result of immediate access to information.

In the past, most collaboration would have involved face-to-face meetings with printed documentation. However, collaboration has become more complex, with the need to work with people all over the world, in real time, on a variety of different types of documents, using different devices. In addition, the rate of change is increasing, and it is essential that companies embrace cloud services as a means to keep pace with innovation. By integrating best-of-class solutions from multiple companies, building on shared standards, companies can access leading technology at a fraction of the cost of building out systems themselves.

## 2.5 Data Integration and Decision Support

In a recent survey conducted by consulting firm Saugatuck Technology, 32% of respondents indicated that integration is a top concern, second only to data security and privacy at 39%. Further, business users simply cannot afford to wait for traditional data management programs which often take years

for benefits to materialise. In this context, there is a real need for a new approach, building on common standards which leverage cloud systems and protocols to make acquisition, storage and exchange of data a quicker and easier process.

The challenges are very real, though, as data management in oil and gas has to deal with a wide variety of data from a multitude of sources, such as seismic studies, drilling, surface facilities, oilfield and reservoir assessments, and hydrocarbon accounting. There are also increasing numbers of real-time feeds from wells, pumps, storage tanks, valves, and other equipment.

Production engineers require the systematic integration of real-time data along with information from other E&P applications and data sources to allow faster appraisal of operational events, thereby enhancing diagnostics and analysis. The core driver is to transform inputs from all data sources into valuable information that allows asset teams to better understand the state of the asset and take the right decisions on a timely basis.

Standards for data exchange and systems integration are absolutely critical to the success of these initiatives and requires vendor support and commitment. EnergySys is delivered with support for seamless integration with other vendors, including Microsoft and SAP. This integration makes secure sharing of information possible across a wide range of data types.

By combining cloud and open standards, the task for oil and gas operators is primarily one of ensuring that communications are in place, and that measurement equipment provides secure feeds with transmission directly to a centralised historian or to the cloud.

Combining integration and analytics allows companies to execute more effectively, based on timely management decision making. It also allows for increasing self-service capabilities, pulling information to drive key performance indicators for the business.



## 3 Case Studies

### 3.1 Case Study: Marginal Asset

Our initial case study is a marginal asset situated in West Africa, with a large number of wells but relatively low production. A traditional production allocation system for this asset would be large, complex, and expensive to install and maintain.

In this situation, a cloud service like EnergySys can deliver almost immediate returns. The high level of configurability means that services can be made available quickly and in an incremental fashion. There are no significant up-front costs, no requirement for in-country infrastructure beyond connectivity, and no software or hardware licensing worries. Data and reports can be made widely available in a secure fashion, and the reduction in the need for manual processing means that operations are more efficient.

No complex integration is required, as data can be uploaded via spreadsheets or flat files directly into the cloud system, either manually or automatically. Further, as this asset would join a number of others managed in the cloud, corporate reporting functionality allows a global view of performance across assets.

### 3.2 Case Study: Mature Asset

Our second case study is a mature asset, based in the North Sea, where the challenges are very different. Adding production from new smaller, partner-owned, fields is a common and necessary occurrence. An existing hydrocarbon accounting system is in place, but the costs of modification and upgrade are significant. Also, like many mature assets, a large number of associated spreadsheets have been developed alongside the primary system, providing additional reports, data validation, and other business services. These have not been added to the main system because they do not appear to be a good fit, or are relatively small in scope, or because of cost. These additional spreadsheets are difficult to audit and maintain, requiring manual version and quality control.

Switching to a cloud solution in this case is not a straightforward choice, as the investment in the existing system is significant and it essentially performs in a satisfactory fashion. However, the weight of costs for upgrades, combined with the increasingly dynamic nature of the business with new entrants, is a major factor to consider. Also, the opportunity to bring all of the associated spreadsheets within a system with audit trails and version control is compelling. Finally, the existing infrastructure represents a substantial cost; the hardware and software require management and upgrade, and services for backup and storage must be maintained. In many organisations this cost is simply part of internal IT, and is not always apparent, but it is real and significant.

Again, all of the other benefits of the cloud in terms of expanding access and creating communities would be available if the upgrade took place.

### 3.3 Case Study: New Asset

New assets provide a variety of unique challenges for production or hydrocarbon allocation. The commercial rules are often poorly understood until shortly before, or sometimes even after, the asset delivers first production. Secondly, the mechanisms and procedures for operating the asset are based on assumptions and best practice on other assets and are frequently subject to change in the first few months of operation. New reports can be required, and calculations must be added or modified.

Unexpected consequences of design decisions can be encountered, and these require rapid revision to reflect the new business models.

Finally, the asset itself might not perform as expected, and issues like early water cut or changes to tanker lifting schedules can have a huge impact.

As real and important as these challenges are, they are made worse by the buying processes associated with the acquisition of a new system. The right approach is to select a system to support the business, and to build functionality incrementally, investing in proportion to the value. Instead, a large, one-off budget is typically allocated, and an attempt is made to capture all possible functionality in a major requirements document. For those requirements documents that avoid the trap of describing how something should be done, rather than simply what, there is still the danger that the only response possible is a highly customised system. Indeed, developing lengthy requirements documents or functional design specifications is virtually a guarantee of the imminent arrival of a large team of consultants and programmers.

Further, the need to specify everything in advance, rather than delivering incrementally, means that functionality is frequently wrong, or missing, and spreadsheets end up being used to augment the primary tool.

The configurability inherent in cloud solutions makes this an avoidable situation. Design decisions are about the configuration to be done, rather than the implementation, and the time to complete this is very short. Business rules can be developed and changed very quickly, and in a completely controlled way. Functionality can be added incrementally, so that there's no need to specify everything in advance. The costs are defined primarily on the basis of consumption, so substantial up-front costs are not incurred, and investment is directly proportional to value returned.

Fundamentally, this is a different way of approaching this problem, and requires an understanding that what is being purchased is a highly configurable but completely standard system, rather than a product or framework requiring programming.

## 4 Conclusions

### 4.1 Focus on the Bottom Line

Cloud pricing models are typically based on a consumption metric. It's normal for upfront costs to be significantly reduced, and to pay only for what you use. For example, the Salesforce CRM system charges on a per user basis. You can add or subtract users, as your needs change, and what you pay goes up or down.

The annual subscription charge for the EnergySys service is around one cent per barrel of annual forecast production under management in the system, and this figure can be fixed for three, five or even ten years. It can even be paid monthly. Thus, you can be absolutely sure of what you'll pay for the most comprehensive system available on the market today: if your production is forecast to decline, then your subscription will decline too.

The EnergySys cloud solution doesn't require customers to purchase software licenses, or separate maintenance and support agreements. It doesn't require investment in servers, or storage, or disaster recovery sites, unless a customer chooses to run the EnergySys Private Cloud. It doesn't require a project team for software upgrades, and it doesn't require database administrators or IT support staff. If a change in business logic is required, like an update to the allocation rules or a change in validation logic, it doesn't require programmers or consultants to do it. Changes are quicker and easier to make, and that means that the business is more agile as a result and can respond more effectively to change.

### 4.2 A Revolutionary Choice

EnergySys clients, including Addax Petroleum and TAQA, believe that EnergySys is the most cost-effective, flexible, configurable and powerful system on the market today. Its unique architecture means that every customer's data is separate and secure, while running on a common software platform. We can focus all of our support and development on a single product, and each new update is released to all customers at the same time with no hassle, and no significant downtime.

The pricing model is clear and unambiguous, providing certainty and a direct link with unit lifting costs over the life of field. It avoids the hidden costs of traditional systems, and of spreadsheets, and renders transparent the link between investment and return. It is the only choice for companies that need to reduce costs in order to survive in the volatile oil and gas industry.