How 'Integrated' is an Integrated Oil and Gas Company (IOC)? Understanding how and why IOCs pursue alternative business models

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Overview

The most basic strategic question for hydrocarbon producers faced with uncertain markets is: which business model and sales strategy should they pursue? Focusing first on the vertical value chain in the oil and gas industry, at least two stylised business models can be distinguished: (i) pure production and (ii) fully integrated production, supply, trading and marketing (ISTM). As the name suggests, the second model is a strategy that tries to capture the whole value chain; it is also commonly referred to as the integrated oil and gas business model, whereby producers participate in activities further downstream, such as wholesale trading, processing, transportation, logistics, storage and direct sales and marketing. Indeed, market analysts will often simply use the term 'integrated oil and gas company' (IOCs) as the generic description for all large publicly traded oil and gas producers to distinguish them from the national oil companies (NOCs), and smaller producers who are seen as unable to span the full chain. Relatively little emphasis is usually placed on the nature of the integration in different companies, which is the focus of our study. We examine both IOCs and NOCs to better understand the degree of integration across firms.

The trading and marketing functions play different roles within the organisational structure of hydrocarbon producers and can make very different contributions to sales, revenue and profit. For example, a midstream-dominated company may see the trading function as supplemental to its main activity – marketing final energy products – and hence use wholesale trading to hedge their downstream position. By contrast, many upstream-dominated producers see trading as a means of hedging their produced commodity and, in turn, marketing can help in hedging and supporting their trading business. A pure production strategy specialises in production, so pure producers do not engage in wholesale trading.

In general, the degree of downstream participation varies from one oil and gas producer to another, depending on their competitive advantages, produced commodities (oil or gas or both), organisational culture, history and values. For example, companies such as BP (with its renowned Integrated Supply and Trading division), Shell, Total, Statoil, and ENI, actively participate in wholesale gas trading whereas Sonatrach, Anadarko, Apache, BHP Billiton, Marathon Oil and Woodside have limited or indeed no wholesale gas trading and direct sales to final customers. Somewhere between these two extremes are companies such as ExxonMobil, Chevron and Gazprom, which have established gas trading and marketing activities that are rather limited in scale and scope. Note that this list is not intended to be comprehensive: it is not our aim to provide an exhaustive listing and categorisation of all oil and gas companies in terms of their degree of vertical integration and business strategies. Instead, these companies serve as examplars. Moreover, the categorization above is based on the natural gas value chain and would be different for the oil value chain.

The choice of business strategy between these two poles – from pure production to fully integrated ISTM business models – is not straightforward. There is ongoing debate amongst leading strategic advisors and practicioners over the appropriate sales strategy for producers of commodities such as oil, gas and coal in changing and complex (liberalised) markets. For example, Kose et al. (2013) analysed thermal coal production in Asia Pacific in an oversupply environment and concluded that coal producers can increase profitability and reduce earnings volatility by expanding their activities downstream into trading, marketing and logistics. Similarly, Himona et al. (2014) analysed whether international oil companies should disintegrate and concluded that they should remain integrated; in particular, physical trading was found to contribute 7-8% of their downstream profit and physical trade was identified as a 'glue' that binds all value chain parts of the oil industry, allowing these firms to optimise and enjoy integration benefits. Corsini et al. (2013) stressed the importance of trading and portfolio optimisation when markets are complex and liberalised. By contrast, Forrest et al. (2011) championed the idea that specialisation is the future and that integrated oil and gas market players (producers that are integrated with supply, trading and marketing functions) have lower effective stock prices than pure upstream (or pure downstream) players and are less incentivised to develop reserves than pure producers.

We contribute to this ongoing debate over strategy by conducting a systematic and comparative analysis of business strategies of major oil and gas producers, principally looking at the evolution of business strategies of large Euroepan gas suppliers – Statoil, Sonatrach and Gazprom – from 2008-present. To our knowledge, a systematic analysis of pros and cons of these business strategies has not yet been attempted. Therefore, our research has two main objectives: (i) to understand the diversity of business strategies employed by major oil and gas producers in the face of uncertainty, and (ii) to examine the rationale behind the choices of these strategies.

In general, some have suggested that the integrated oil and gas business model is less risky than the pure upstream or downstream models (Forrest et al., 2011). This is primarily because downstream participation is a natural hedge for upstream players when commodity prices fall (Sheppard, 2015; Zhdannikov and Bousso, 2015; Mercatus Energy Advisers,

2014). However, such hedging comes at a price for oil and gas producers: according to Forrest et al. (2011), the effective stock price and reserve-replacement ratio for integrated players are lower than for 'focused' players, which is not surprising as holding an option has a price. Other benefits of downstream participation for oil and gas producers include flexibility and portfolio effects (see Kose et al., 2013; Corsini et al., 2013) as well as market intelligence (Sheppard, 2015; Dison, 2011).

As a result, integrated players should have better market understanding stemming from direct participation in wholesale trading, and should be able to behave strategically by not developing reserves as quickly as expected in a competitive market or as fast as pure upstream producers would do. Pure producers can therefore be seen as price-takers, and, hence, they tend to focus on optimising their cost-side and upstream performance rather than exploiting market opportunities. Indeed, the transaction cost economics perspective suggests that one of the rationales for downstream integration by upstream producers is 'exploit[ing] market power and raising barriers to entry' (see e.g. Stuckey and White, 1993), and this has traditionally been done via bilateral bargaining and long-term contracts between gas buyers and sellers in the absence of spot trading. However, when downstream gas markets are liquid and liberalised, the ability to exploit pricing power optimally is only possible when producers participate actively at the wholesale trading level, giving them more accurate information about market dynamics and allowing for better pricing strategies.[1] Drawing on our empirical findings, we argue that exploitation of price arbitrage and pricing power in the gas markets can be better achieved with the ISTM business model. By contrast, almost all existing studies of gas market modelling (amongst others, see, e.g., Zwart and Mulder, 2006, Holz et al., 2008, Lise and Hobbs, 2008, Gabriel et al., 2012, Abada et al., 2013, Chyong and Hobbs, 2014, Growitsch et al., 2014), if they do assume that some market participants have pricing power, justify this choice based on a rather simplistic view, such as by looking at the size of the gas reserves in exporting countries. Thus, our research can also be used in future gas modeling studies by providing a more rigorous basis for assumptions about the use of market power.

Methodology and preliminary results

Our methodology is based on in-depth analyses of business strategies of major oil and gas producers supplying gas to Europe using qualitative research methods, such as analyses of companies' official documents, accounts, reports and interviews with leading energy experts and company representatives as well as quantitative analyses. In particular, for the latter we conducted econometric analysis of more than 600 long-term gas contracts[2] (both pipeline and LNG agreements) focusing on the duration of contracts signed by ISTM companies (such as BP, Total, Shell, amongst others). We found that these contracts are systematically shorter than other LNG and pipeline gas contracts and hence we can conclude that these companies tend to adopt a sales strategy with increased flexibility and trading. Furthermore, we analysed Statoil's gas sales and production strategy by doing an econometric analyses of its two large oil and gas fields, Troll and Oseberg, which have production flexibility and act as swing capacity. We found that after a wave of gas contract renegotiations in Europe (2011), average monthly production from Troll and Oseberg was on average 10% and 40% lower than monthly production in preceding years. This insight is statistically significant even accounting for various effects (maintenance work at Troll, spot prices, EOR, seasonality and other market dynamics). One should note that lower output from Statoil's swing capacity is against the trend of increased production and supplies from Norway to Europe in the same period (2011-2014).

Conclusions

Based on the case study of Statoil we can conclude that the company changed its business strategy in response to structural changes in the global gas markets. In particular, we consider that the obtained results to be a startling manifestation of a new gas sales strategy in a liberalised market – one that is based on direct and active trading and engagement with spot pricing. Clearly, Statoil's two production assets - Troll and Oseberg - serve as marginal fields and, as such, the accompanying flexibility means Statoil is able to respond optimally to spot prices and market dynamics: in an environment of oversupply and increased inter-fuel competition from other energy sources, the ability to shift production from flexible fields to future periods to place upward pressure on current spot prices inenvitably creates value for Statoil. However, such a strategic response is only possible if and when a company is actively participating in liquid trading markets to understand market dynamics fully and benefits from information flows. We intend to conduct similar analyses for Sonatrach and Gazprom using both qualitative and quantitttive analyses. We expect that this research and its insights will contribute to the wider literature on corporate strategy and, in particular, to the economics of oil and gas business strategies in a rapidly evolving and highly volatile business environment.

[1] Note that this argument may not necessarily be applicable to the crude oil market and the exploitation of market power by large oil producers. The oil market is so liquid and deep, with an extremely competitive shipping market, that oil trading is less logistically challenging and less critical to the business model. As such, market intelligence is not particularly important for oil producers in exercising their pricing power. By contrast, to even exploit price arbitrage in the European pipeline gas market, major gas players must have excellent understanding of local commodity markets and regulatory regimes as well as transport capacity markets and these activities have to be coordinated.

[2] The data was obtained from a database of contracts for pipeline gas and LNG published online by researchers from the German Institute for Economic Research (DIW) (Neumann, et al., 2015) as well as from Poten and Partners' LNG contract database, accessed through the Bloomberg Terminal.

References

Abada, I., Briat, V., Gabriel, S. A. and Massol, O. (2013). "A Generalized Nash-Cournot Model for the North-Western European Natural Gas Markets with a Fuel Substitution Demand Function: The GaMMES Model," Networks and Spatial Economics, 13(1), pp. 1-42.

Chyong, C. K. and B. F. Hobbs (2014). "Strategic Eurasian natural gas market model for energy security and policy analysis: Formulation and application to South Stream," Energy Economics, 44, pp. 198–211. http://dx.doi.org/10.1016/j.eneco.2014.04.006.

Corsini, C., S. Heiligtag and D. Inia (2013). "Strategic choices for midstream gas companies," McKinsey Working Papers on Risk, No. 50. http://www.mckinsey.com/~/media/McKinsey/dotcom/client_service/Risk/Working%20papers/50_Strategic_Choices_for_Midstream_Gas_Companies.ashx, accessed 8 June 2015.

Dison, J. (2011). "The future of supply trading in the oil and gas industry," Oil & Gas Financial Journal, 08-02 (published online 1 February 2011) http://www.ogfj.com/articles/print/volume-8/issue-2/features/the-future-of-supply-trading-in-the-oil.html, accessed 10 July 2015.

Forrest, R., J. Pearce, T. Lewe, I. Schroeter, J. Doerler, N. Walters, V. Kaushal and L. Besland (2011). "Challenging the integrated oil and gas model: In O&G, do specialist companies create more shareholder value than integrated companies?," A.T. Kearney report. https://www.atkearney.com/documents/10192/339986/Challenging_the_Integrated_Oil_and_Gas_Model.pdf/c069162a-6db3-4380-b868-5e5c90db7e0a.

Gabriel, S. A., Rosendahl, K. E., Egging, R., Avetisyan, H. G. and Siddiqui, S. (2012). "Cartelization in gas markets: Studying the potential for a "Gas OPEC"," Energy Economics, 34(1), pp. 137-152. http://doi:10.1016/j.eneco.2011.05.014

Growitsch, C., Heckin, H. and Panke, H. (2014). "Supply disruptions and regional price efects in a spatial oligopoly - an application to the global gas market," Review of International Economics, 22(5), pp. 944–975.

Himona, I., M. Ennebati, E. Solovyov and J. Herrlin (2014). "Oil and gas: Deep diving downstream: Integration works," Société Générale Cross Asset Research, accessed through Bloomberg Terminal

Holz, F., Hirschhausen, C. V. and Kemfert, C. (2008). "A strategic model of European gas supply (GASMOD)," Energy Economics, 30(3), pp. 766–788.

Kose, O., J. Smyth, and X. Veillard (2013). "From thermal coal production to marketing and trading: A growth opportunity for the coal mining industry in Asia Pacific," Accenture report. https://www.accenture.com/t20150624T211120__w__/cn-en/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Industries_8/Accenture-Thermal-Coal-Production-Marketing-Trading.pdf#zoom=50, accessed 7 May 2015.

Lise, W. and Hobbs, B. F. (2008). "Future evolution of the liberalised European gas market: Simulation results with a dynamic model," Energy, 33(7), pp. 989–1004.

Mercatus Energy Advisers (2014). "Is vertical integration a sound energy hedging strategy?," Mercatus Energy Advisers Blog (published online 25 November 2014). http://www.mercatusenergy.com/blog/bid/105773/Is-Vertical-Integration-A-Sound-Energy-Hedging-Strategy, accessed 7 May 2015.

Neumann, A., S. Ruester and C.v. Hirschhausen (2015). "Long-term contracts in the natural gas industry: Literature survey and data of 426 contracts (1965–2014)," Data Documentation 77, DIW Berlin. https://www.diw.de/documents/publikationen/73/diw_01.c.498163.de/diw_datadoc_2015-077.pdf, accessed 7 August 2015.

Poten and Partners (2015). "LNG contract database", accessed via Bloomberg terminal.

Sheppard, D. (2015). "Trading helps BP weather oil price fall," Financial Times, (published online 29 April 2015). http://www.ft.com/intl/cms/s/0/8d143dd2-ee2e-11e4-88e3-00144feab7de.html, accessed 7 May 2015.

Stuckey, J. and D. White (1993). "When and when not to vertically integrate," Sloan Management Review, 34(3), pp. 71–83. http://www.mckinsey.com/insights/strategy/when_and_when_not_to_vertically_integrate.

Zhdannikov, D. and R. Bousso (2015). "Shell, Total align trading and refining units to drive profit growth," Reuters (published online 1 May 2015). http://uk.reuters.com/article/oil-majors-refining-idUKL5N0XS0M120150501, accessed 7 May 2015.

Zwart, G. and Mulder, M. (2006). "NATGAS: A model of the European natural gas market," CPB Memorandum 144. http://www.cpb.nl/sites/default/files/publicaties/download/memo144.pdf, accessed 9 January 2009.