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BUSINESS MODEL INNOVATION IN THE OIL & GAS INDUSTRY

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Overview

The traditional energy industry, which is characterized by large-scale and centralized production, faces disruptive change through emerging renewable and decentralized energy technologies. The rapid growth of the renewable energy sector, fuelled by policy support and massive cost decreases, has high impact on established players and business models in the energy sector. In Germany, for instance, the major electric utilities lost about EUR 500 billion in market capitalization over the past five years (The Economist, 2013).

Similar developments are likely to occur in the oil & gas industry. Despite the current strength of the industry in terms of profitability, the business models as such have their limits – from both, a supply and demand perspective. A more rapid than expected decline in the output of existing fields, a decelerated discovery of new fields, and the alleged end of easy oil highlight the fact that the upstream business environment is undergoing significant changes with severe consequences for the actors in the field. Although the proven reserves are typically estimated to last well above the next 50 years (OPEC, 2013) two major factors shaping the demand side might accelerate a faster shake-up of the industry, potentially resulting in a peak in demand for oil and gas. Both, policy targets as well as technological development might significantly further increase the competitiveness of renewable energies vs. fossil fuels in the near future. Additionally, energy efficiency targets decrease the demand for oil & gas in the automobile, heating and electricity sectors.

The question arises, which oil & gas companies are best positioned to deal with the likely disruption of their industry. Christensen's theory on disruptive innovation (Christensen, 1997) argues that industry incumbents typically put high emphasis on fulfilling current customer needs and thus invest in innovation that is targeted to improve their existing products and services (sustaining innovation). Thus, incumbents often fail, as they do not sufficiently pay attention to disruptive innovation introduced by new entrants in the market.

In order to answer our research question we investigated the R&D and innovation activities of major oil & gas companies in Europe. Our findings show that the oil & gas companies in our study can be assigned to three different groups: the *exploiters*, the *explorers* and the *transformers*. The majority of the oil & gas players in our study still invest in existing technologies and business models. A large group of players also significantly fosters R&D and innovation in the new technology sectors. However, only a fraction of the firms has built up viable business models in these new sectors.

Methods

In this study, we applied an inductive comparative case study approach (Eisenhardt, 1989) and followed three steps in order to generate our findings.

First, we limited our sample to companies that are active in the European oil & gas industry and ensured representativeness in terms of size, national and international engagement, geography etc. In a second step, we generated data and information on investment in R&D, innovation activities and other firm indicators for a final list of 15 companies over a five-year period, from 2008 to 2012. In a third step, we compared the companies along a list of quantitative (e.g. total R&D spending, R&D spending/EBIT, no. of patents registered) and qualitative criteria (e.g. type and content of R&D investment/innovation activities).

Results

Based on our analysis three different segments of players emerged that specifically differ in their overall spending on R&D and innovation and their engagement in the new energy technology sectors:

Exploiters – the first group of players, mainly National Oil Companies (NOCs), focus on their core business and are specifically engaged in sustaining innovation along the value chain such as technology upgrades, frontier exploration and product optimization. Their average level of R&D spending and patent activity is relatively low. They rather act as integrators that insource new technology from smaller, specialized firms.

Explorers – the second group, mainly large International Oil Companies (IOCs), highly invest in R&D and innovation with the majority still assigned to the traditional oil & gas technologies and business models (e.g. specialized deep-sea drilling equipment, floating mobile platforms), but significant investments are also made in new energy technologies. Investments in alternative and renewable energy technologies, however, are rather unfocused and cover a wide range of different technologies and markets.

Transformers – the third group of firms is still mainly engaged in their core oil & gas businesses but has already built up or currently builds up business models in the new energy technology sector. This very small number of oil & gas players invests significant amounts (>30%) of their innovation budget into emerging technologies and renewable energy.

Conclusions

This analysis shows that by far the majority of the selected sample of oil & gas companies scarcely invest (in absolute and relative terms) in new energy technology sectors such as renewable energy. Despite notorious difficulties in predicting future developments in the energy industry, our findings suggest based on theoretical insights and compared to empirical evidence from the electric utilities industry that most of the oil & gas companies in our sample are not adequately positioned to build up new and viable business models in a future energy world with high emphasis on sustainable and decentralized energy production. In order to survive a potential shake-out of the industry, it is important for oil & gas companies to more rigorously invest in R&D and innovation activities (e.g. open innovation, innovation incubators/accelerators, coopetition), which are specifically targeted to develop new business models for tomorrow's energy markets.

References

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