

PREPARING FOR A FUTURE OF LOW CARBON ENERGY: RENEWABLE ENERGY PROJECTS OF OIL AND GAS COMPANIES

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Abstract

Oil and gas companies are amongst the largest organizations of the global economy that have the possibility to influence important economic and social processes. The future of these companies could look unfavorable since the role of fossil fuels will be much less important than today. Such future is considered a must in order to prevent disastrous impacts of climate change, but also for securing a safe energy supply. In this context, we explored at what extent oil and gas companies are interested in renewable energy projects by searching for this type of activity in their business portfolio, identifying the types of renewable projects and their size. The findings confirm some previous results, especially the focus of oil and companies on biofuels. Other renewables of interest are power plants based on solar, geothermal, and wind energy. The strategy of these companies for a low carbon future might also comprise investments on the capital market that further needs to be explored for a better understanding of how these important actors are adapting to the requirements of sustainable development.

Keywords:

Renewable energy, clean energy, oil and gas companies, investment

Introduction

Reducing carbon footprint is one of the top environmental priorities of the world today. By this there are achieved two major environmental goals: firstly, climate change mitigation by avoiding the release of carbon dioxide that is responsible for a warming climate; and secondly, increasing energy security by shifting from exhaustible resources like fossil fuels to renewable resources like solar, wind, geothermal and others.

Currently, most of the energy demand is met using fossil fuels as primary energy source (Petrescu et al., 2009). Nonetheless, increasing attention for sustainability created an enabling context for the development of large scale renewable energy projects (Pirlogea, 2012). Analysts highlight, for instance, that in 2015, the investment in renewable energy reached a historical height, being of 329 billion USD and that this trend also continued in 2016 (White, 2016; Macalister, 2016; UNEP and Bloomberg, 2016).

The energy industry is made up mainly by large companies. Many of them are also very influential in relation with public authorities since their close collaboration in infrastructure development. Oil and gas companies are in the frontline, since they are amongst the largest providers of energy.

The prospects of low carbon energy, which are clearly outlined by approved strategies and programs, will have a significant impact on the operations of energy sector companies, especially on oil and gas companies, since their products are to be replaced. Does this also mean that these companies will face a short and brutal end? This possibility was predicted already by Stevens (2015) and Levy and Kolk (2002) unless those companies are rethinking their businesses in the energy sector. Our paper is looking for evidence that oil and gas

companies are aware about this challenge of sustainable development by developing projects for renewable energy.

The first part of the paper consists in a literature review that summarizes the findings for this question in previous research papers. The next section presents the oil and gas companies that will be analyzed using several economic indicators. Further, information regarding renewable energy projects of these companies is organized by considering their type, production capacity, and investment. The data regarding oil companies is collected from the annual and/or sustainability reports of the companies. The companies included in the study were selected using the 2016 Forbes ranking of the 10 biggest oil companies of the world. The results will highlight if the most important players of the energy sector are aligned and acknowledge the requirements of sustainable development and how they understand to adapt to the low carbon energy future.

1. Literature review

Renewable energy accounts only for a small proportion as primary source that is used to meet demand. Heading toward a low carbon future means large scale development projects in this sector that will require large investments to be made.

In 2015 it was recorded a historical height of the investments made in renewable energy projects worldwide. The additional capacity in this sector exceeded other energy investments accounting for 53.6% of the installed capacity in 2015. By this it was prevented the release of 1.5 Gt of carbon dioxide emissions. Although these are important accomplishments, the Paris summit on climate change warns that the emission trend is not yet in line with the requirements of an adequate mitigation. Investment money was almost evenly split between emerging economies (Brazil, India and China) and developed countries. The cost of generation is recording a downward trend, especially for solar electricity, while policy support is inconstant (UNEP and Bloomberg, 2016).

Csomos (2014) finds that although oil and gas companies recognize the need to use renewable energy, the size of demand and its increasing prospects makes fossil fuels unavoidable in the years to come. He also finds that some companies admit they are not willing to address renewables that are less profitable than their core operations, while other recognize the impact of stakeholder pressure. In this respect, renewables have a great impact. By 1-2% of the total investment, renewable projects significantly improve the public image of the company.

	Biofuels	Wind	Solar	Tidal	Geothermal	Hydrogen
British Petroleum	☑	☒	☒			☒
Chevron	☑		☒		☑	
Conoco Philips	☑					
ExxonMobil	☑					
Shell	☑	☒	☒			☒
Total	☑	☒	☑	☑		☑

☑ Continuing investment

☒ Cancelled or downscaled investment

Source: Morton (2015)

Fig. 1 The state of renewable investment for major oil and gas companies

Morton (2015) reports that large oil and gas companies like Exxon, Chevron, Shell etc. invested in renewable energy projects in the last decades. The pattern that could be observed is that initially more types of renewable projects are developed, but after several years only some of them are maintained. The most common renewable project for such companies is the production of biofuels, activity that improve the use of capacity (fig. 1). The most important renewable projects developed by oil and gas companies are: solar manufacturing, wind power, research and development for hydrogen fuel cells, geothermal energy, and even nuclear plants.

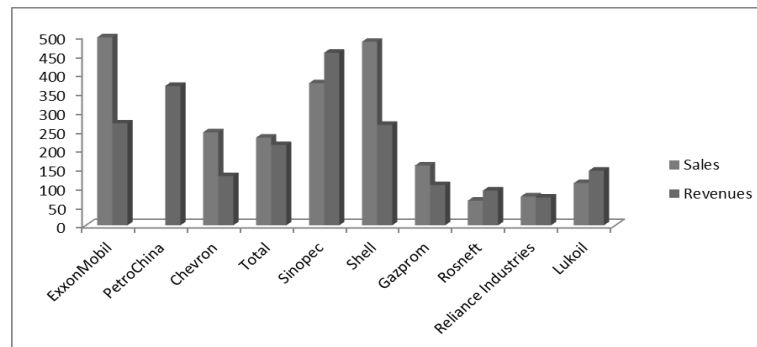
2. Methodology and data

Oil and gas companies are remarkable by their size, amount of money, number of employees, and even impact on the social and economic context in that them operate. The companies were selected using Forbes latest listing, namely the 2016 list of the largest 25 oil companies. Out of these, we selected the first ten companies.

Selecting the largest companies for analysis is a common practice in researching various aspects of the oil industry (Morton, 2015; Csomos, 2014). There is actually a group of six companies coined as super majors or International Oil and Gas Companies (IOCs). These companies are the ones presented in fig. 1.

Our list comprises four out of the six, since in 2016 Conoco Philips and British Petroleum did not make to the Forbes ranking. Nonetheless, these companies are still very influential in the oil business.

Our sample comprises 10 companies located in USA, China, France, Netherlands, UK, Russia, and India, but most of them are having worldwide operations. For instance, Total is a French company conducting operations in 130 countries. In fig. 2 we present the total sales and revenues for these companies in 2015.



Source: Fortune Global 500

Fig. 2 Sales and revenues of the sample companies (billion USD)

For each company, we aim to find information about the existence of renewable energy projects, the portfolio of these projects by type of renewable energy, size of project. In case that no renewable energy project is operated by the company, it will be mentioned the company's position regarding this issue.

Data was collected by accessing the web site exploring pages concerning businesses, sustainability, energy and annual reports.

3. Renewable energy projects of oil and gas companies

ExxonMobil (USA) – the company is interested only in advanced biofuels (e.g. algae, non-food biomass) and supports research and development in this direction.

Petro China (China) – interprets clean energy as energy with lower carbon emission and consequently focus on gas production. Renewables are regarded as „new energy”, and it expressed the company's interest in developing capacities for geothermal energy from local and Nigerian fields, solar energy that is used to power oil wells, and biofuels, especially ethanol from various biomass sources.

Chevron (USA) – is a company that accomplished its mission to become a world leader in the production of geothermal power. It also considers gas as a less carbon intensive fuel that should be used on the long term. Major geothermal projects are in Indonesia (647 MW) and Philippines (692 MW). In the US the company operates geothermal, solar, wind, and gas power plants.

Total (France) – the company is the most important oil and gas investor in renewables by a 1 billion USD investment made recently (Macalister, 2016). Solar power, energy storage, and biofuels are the components of the renewables portfolio. The company created Sun power that employs 5000 people, operate in 16 countries, and have a 2.5 GW installed capacity. Major solar projects are PV San Salvador (Chile) – 68 MW; Solar Ranch in California (USA) – 250 MW; Shams (concentrated solar) (UAE) – 100 MW; Solar Star in California (USA) – 709 MW; Prieska Solar (South Africa) – 75 MW. The company claims to produce the most efficient photovoltaic panels, reaching 21.5% efficiency in converting light to electricity.

Sinopec (China) – the company is interested in new energies by funding research and development for biofuels. It already produces fuel ethanol and biodiesel and started the use of cellulose ethanol technology, and algae based biodiesel.

Shell (Netherlands, UK) – the renewables portfolio comprises biofuels and wind power. It could be also signalled the focus on gas and reduced emission of its burning.

Gazprom (Russia) – is interested in fostering gas as a clean fuel especially for transportation by shaping the car market. Besides this, the company manage some gas fuelled thermal power plants.

Rosneft (Russia) – the volume of renewable energy is not disclosed because it is considered insignificant. The company states its intention to develop in this direction too.

Reliance Industries (India) – although the company is committed to sustainability, its business focus fall on core operations and how these can be improved by backward and upward integration.

Lukoil (Russia) – renewable portfolio comprises hydro power and wind power. Hydro power capacity is of almost 300 MW in four projects located in Russia, while wind power capacity is of 744 MW with farms in Bulgaria and Romania since 2014.

Conclusions

Renewable energy is a major pathway toward a low carbon future and increasing its share in the energy mix is a top priority of the governments. This driver will become more intense in the next decade, since the goals agreed on in Paris are much more ambitious by envisaging a zero carbon future (Bran, 2016). Nonetheless, the ratio between fossil fuels and renewable energy is not changed much in the last three decades in that sustainable development is assumed, at least as intention.

Our paper explored how the challenge of low carbon future is addressed by one of the most important players of the energy sector – oil companies. Their prospects in the low carbon future are dark, with the threat of sudden closure on the medium term. One possible

strategy would be to invest in renewables and gradually shift production away from fossil fuels. At what extent this is happening was explored by analysing the 10 largest companies of the industry.

The renewable energy is an attractive investment in the last year, with money flowing mainly for solar power projects. This could be considered a positive trend, but the share of renewable energy remains the same, of around 10% of the total. For changing this, there is a lot more action to be done.

Oil companies are interested in renewable energy projects. This interest might be genuine, as it is for Total, being proved by sizable investment and production capacity, while for others the only information regarding this issue could be found in the checklist of sustainability indicators recommended by the Global Reporting Initiative (e.g. Rosneft).

The sample comprised four companies that have only interest regarding renewables. The portfolio comprises first, but mainly second generation (advanced) biofuels (ExxonMobil, Total, Sinopec, and Shell), solar power (Total, Chevron), hydro power (Lukoil), geothermal power (Chevron), and wind power (Lukoil, Shell). Renewable project size is mentioned only for power generation. Solar projects are smaller, with installed capacities varying between 70 and 700 MW, followed by hydro and wind, the largest projects being based on geothermal energy.

It could be concluded that there is not yet observable signs of a major change in the oil and gas industry toward replacing oil and gas as main primary energy resources. Nonetheless, reports and statements reveal an important message: oil and gas companies are foreseeing the use of gas as a strategy for reducing the carbon footprint (gas is clean energy).

Further research might address the investment portfolio of oil and gas companies for exploring their less observable implication in the development of renewable energy projects.

References

1. Bran, F. (2016). Paris climate agreement: responsibilities and commitments for a sustainable future. *Calitatea*, 17(S1), 298.
2. Csomós, G. (2014). Relationship between large oil companies and the renewable energy sector. *Environmental Engineering and Management Journal*, 13(11), 2781-2787.
3. Levy, D. L., & Kolk, A. (2002). Strategic responses to global climate change: Conflicting pressures on multinationals in the oil industry. *Business and Politics*, 4(3), 275-300.
4. Macalister, T. (2016). Green really is the new black as big oil gets a taste for renewables. *The Guardian*, May.
5. Morton, M. (2015). Is there still a role for oil companies in renewables? *Greentech Media*. March.
6. Petrescu-Mag, R. M., Roba, C., & Petrescu, D. C. (2009). The Romanian perspective on geothermal energy resources. The chemistry of the geothermal waters from Oradea Triassic aquifer. *Well testing*, 70, 110.
7. Pirlogea, C. (2012). Investments for a sustainable energy future. *Business Excellence and Management*, 2(1), 21-30.
8. Stevens, P. (2015). Globalizing Oil: Firms and Oil Market Governance in France, Japan, and the United States. *Energy Journal*, 36(3), 362-363.
9. UNEP and Bloomberg (2016). Global trends in renewable energy investment in 2016.
10. White, W. (2016). How traditional energy companies are building a viable future for renewables. *Alberta oil magazine*, July.