OIL INDUSTRY WITHIN CLIMATE CHANGE

CARMEN VALENTINA RĂDULESCU, ILDIKO IOAN

ABSTRACT. - Oil industry within climate change. Scenarios regarding the evolution of energy sector in the next decades confirm the upholding of oil's role in providing the resources needed. Oil industry companies represent in this context actors of whom action modality becomes significant for emission reduction and climate change adaptation. Our paper aims to explore the challenges of energy sector, the perspectives oil demand and supply and which is the position of the most prominent oil companies at international and national level in approaching climate change. The results show that one of the most important climate change stakeholder records a lag in the general effort invested in finding solutions for this global problem.

Key words: energy security, GHG emissions, climate change, environmental reporting

1. Introduction

Oil's life cycle has important contribution to greenhouse gas (GHG) emission. Its final user, transportation, is the second contributor to the overall emissions at global level. GHG emissions occur in every stage of the lifecycle, but the largest contribution is the final stage of burning the fuel. In fact, the emissions from this stage are fifty times higher than the total contribution of the other stages

Scenarios regarding the evolution of energy sector in the next decades confirm the upholding of oil's role in providing the resources needed. Oil industry companies represent in this context actors of whom action modality becomes significant for emission reduction and climate change adaptation.

Our paper aims to explore of challenges of energy sector, the perspectives oil demand and supply and which is the position of the most prominent oil companies at international and national level in approaching climate change.

Insights about oil companies' position in mitigating climate change could provide useful information in policy making, especially in order to strengthen these actors motivation for more investments in clean technologies. Further studies could bring valuable contribution by exploring other sectors such as automobile industry and power generation.

2. Continuous energy supply and reduction of greenhouse gase emissions – major challenges of energy sector

World energy system faces, according to the most recent report of International Energy Agency (IEA, 2008) two major challenges: securing continuity in energy supply and reformin the energy supply system in such a way that significant improvement to be achieved in carbon dioxide emission reductions.

Securing continuity in energy supply represents a major challenge because, at world level, it is forecasted a continuous and strong increase in energy demand (Energy Information Administration – EIA, 2008). This tendency is explained by economic growth, correlated with population growth and productivity increases, mainly, in developing countries.

According to the most recent scenarion made by different international organizations (OPEC, EIA, IEA), at global level, population will grow with an annual rate of 1 percent, reaching more than 8 billion in 2030. This increase will be determined in proportion of 94% by demographic evolutions of developing countries and of North America. Productivity increase is due to increase of capital, intensified international trade within the framework of globalization and of economic reforms impact.

In such conditions, it is estimated a global economic growth of more than 3% at the purchasing power parity. Regional contributions to the growth are differentiated. China could be considered as en engine of world economic growth. In addition in 2004, 2005, and 2006 China recorded two digits economic growth. A very dynamic growth is also expected in India, where the effect of population growth is additioned with the impact of economic reforms represented by improved productivity and better capital endowment.

World energy consumption is expected to boost continuously until 2030, estimated annual rates being of 1.6%, and the total volume of 17 010 Mtoe. Securing continuity of energy supply is condition by major investment in energy infrastructure. More than half of investments are necessary for maintaining the current level of supply by replacing existent infracstructure.

In oil industry investments are necessary for exploring new deposits and enlarging production capacities. In the 2006-2020 period refinery capacity will necessitate an enhancement with 13 Mbarrels per day.

Reforming energy supply system for lessen the carbon dioxide emissions is motivated by the protection of global climate system. Climate change is one of the most important environmental issues to be addressed by humanity. IEA (2008) considers the current energy tendencies will generate such icnrease in carbon dioxide emissions that could induce a global temperature raise of 6 Celsius degrees. In this situation, according to IPCC scenarios (2006) environmental changes will be catastrophic from a human perspective.

Energy sector has a key role to play for reducing greenhouse gase emissions. The main changes to accomplished are improving energy efficiency, modification of energy supply structure by sources in favor of renewable energy and development of carbon storage technologies.

Enacting of these changes is possible if government will manage to apply and effective combination of policy tools (regulations, financial incentives, communication, and information) meanwhile securing continuity of supply. IEA (2008) consdieres that the elimination of subsidies in non-OECD countries could have a valuable contribution in the reduction of energy demand and fosil fuels emissions.

3. Oil demand and supply

According to Exxon (2007) transportation will be responsible for the largest increase in energy consumption. In 1980-2005 global energy demand for transportation increased, in average, with 2.2% per year. Individual transportation is positively correlated with economic growth. Therefore it is foreseanable an important boost of car numbers and of their consumption. Currently, 80% of the light autovehicle park is owned by OECD countries. Their number increased with 2.6% per year in 2000-2005 and with 5.2% in non-OECD countries. Since technological changes for efficiency improvement were already implemented in Western Europe and progressed also in USA, consumption will be more stable in these countries. On the other hand, non-OECD countries efficiency gains will not be able to compensate the increase in car numbers.

The analysis of regional consumption (presented in figure 1 and 2) allow us also some interesting observation for the future of oil market:

- The largest oil consuming region (North America, with more than 25 000 thousands barely per day) has a growth rate that is lower than the world average;
- Europe, the third largest consumer (more than 16 000 thousands barrels per day) recorded the smallest variation in consumption, the difference between 1980 and 2005 being of only 223 thousands barrels per day or 1.4%;
- Consumption variation is negative in Eurasia (comprising countries from former Soviet Union, including Russia), while the variations amplitude is almost double compared to the largest positive variation recorded in regional consumption (-121% compared with 65%);
- Middle East record the highest growth rate (65%), but in absolute terms,, this regions consumption represent less than 10% from the total;
- For Asia and Pacific regions the second position is preserved for both contribution to the world consumption and rate of increase.

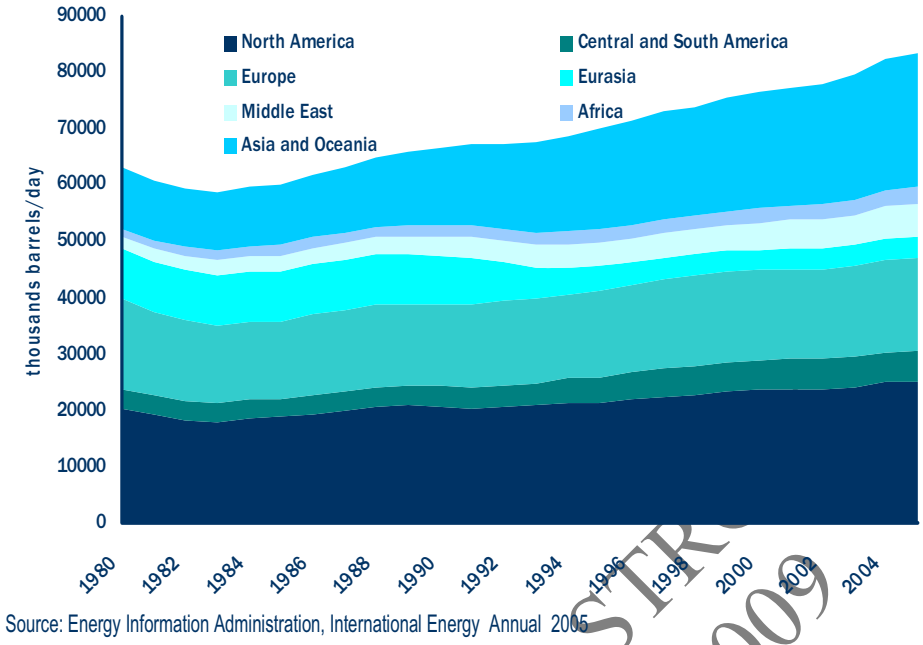

Fig. 1. Dynamic of regional oil consumption

Oil and oil products demand is influenced by numerous factors as it results from the analysis of past evolutions and of the scenarios. We remark that although the economic impact of oil price variations is not as large as in the time of the first oil shock the price influence is still felt and it act as a moderation of demand increase and as an incentive for oil's substitution in power generation. Another factor that has similar contribution is energy efficiency improvement.

On the other hand, oil production is facing important challenges represented by the need for important investments and the peak of oil foreseeable in the nearby future.

Robelius (2007) predicted than oil peak will occur somewhere between 2008 and 2018, depending on different circumstances. Taking in account the latest records of oil industry, which reveal important delays in major oil projects it is more likely that the earlier part of the interval to be closer to reality.

By analyzing the history of oil exploitation, extended over approximately 150 years, it is possible to remark that:

- the largest oil fields were discovered with more than fifty years ago;
- since the 1960s annual oil discoveries tend to decrease;

- since 1980, annual demand exceeded annual discoveries;
- until now more than 47 500 oil fields were discovered, but more than 400 (1%) of them contain 75% of the total oil reserves.

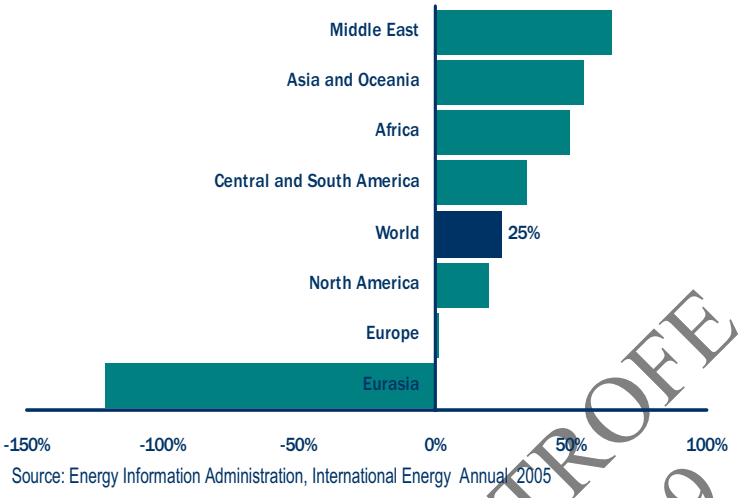

Fig. 2. % variation of regional and world oil consumption in 1980-2005

The historical maximum of discoveries is followed, after a certain period, by a maximum of production (peak). Gross and processed oil production already shows a peak in 2005. This is not enough yet to demonstrate that we are in the peak. Nevertheless, further records will bring, sooner or later, the necessary proves. Chevron (2007) states that the era of easy oil is gone and 33 out of 48 oil producing countries already passed their oil peak.

4. Oil industry actors addressing climate change

Oil companies and their governments' strategies are influenced by different perceptions and estimation regarding the future of oil industry. Old oil companies are involved in fusions, consolidation and concentrate themselves oil related activities, dropping other non-oil activities adopted in unfavorable price episodes. Thus, oil companies pursue to strengthen their historical role, establish and develop cooperation relations with oil exporting countries.

Companies' position regarding certain issues concerning society as a whole could be explored within the framework of the more and more widespread environmental and societal accounting. The most common document to provide information is the company's annual report. At global level, the three largest

private oil companies (ExxonMobil, British Petroleum and Royal Dutch Shell) are already an active presence in environmental reporting (Ioan and Rădulescu, 2008a). These companies enrolled in the effort to improve communication with stakeholders and annually issue a sustainability report which accounts on their position and intentions in contributing to the solution of some common concerns. Although there is no common reporting framework and the reliability of reports is also questionable, they provide useful insights on perceptions. For example, by analyzing the rhetoric of the climate change "closer look" of the ExxonMobile 2007 report, Ioan and Rădulescu (2008b) found some evidence of deflecting public attention from the company's role in mitigating climate change.

In Romania, the oil industry actors are represented by several private companies which are more or less related. The most prominent oil industry actors are Petrom and Rompetrol. According to the Finance Ministry the largest Petrom is the largest company that deploys activities in Romania and Rompetrol is also in the top ten of Romania's largest companies. Other oil industry actors are Lukoil Romania, Mol Romania and OMV. The annual reports of these companies by far less explicit in addressing climate change than their international pairs. In fact, Rompetrol do not prepare this kind of report, while Petrom, although reporting on environmental issues does not use at all the climate change phrase. We could infer their preoccupation for climate change by referring to the report on endowment for nitrous oxides emission and the awareness raising campaign regarding energy efficiency. Nevertheless, in CEO's statements there is no indication of any environmental concern.

5. Conclusions

Mitigating climate change needs more and more involvement on the behalf of every stakeholder. Since it is related closely to energy consumption such involvement will be translated, at certain extent, in changes to be made by all social actors and by individuals as well.

Energy scenarios for the next decades reveal that the increased energy demand of the world will be covered further by using fossil fuels and that oil will play a key role up to 2030. Securing a continuous supply of energy depends more on investments to be made in oil industry than on the physical availability of this fuel, although the oil peak is predicted to be produced in the next few years.

At international level, the most prominent oil companies take climate change seriously and provide report on their actions dedicated for climate change motivation. Nevertheless, leading oil companies in Romania appear to be less preoccupied by environment in general and climate change in particular.

REFERENCES

1. Energy Information Administration (2008), *World Energy Demand and Economic Outlook*, http://www.eia.doe.gov/oiaf/ieo/world.html, <08.11.2008>.
2. ExxonMobil (2007), *The Outlook for Energy. A view to 2030*, http://www.exxonmobil.com/corporate/energy_outlook.aspx, <20.11.2008>.
3. ExxonMobil, 2007, ExxonMobil Taking on the world's toughest energy challenges 2007 Corporate Citizenship Report, http://www.exxonmobil.com/Corporate/files/Corporate/community_ccr_2007.pdf, <20.02.2008>.
4. International Energy Agency (2008), *World Energy Outlook 2008 – Executive Summary*, http://www.iea.org/Textbase/npsum/WEO2008SUM.pdf, <15.11.2008>.
5. Ioan, I., Rădulescu, C.V. (2008a), *Politica de mediu a companiilor petroliere multinaționale*, in *Dezvoltarea socială şi performanță economică*, supplement for the Calitatea – acces la succes, pp.568-573.
6. Ioan, I., Rădulescu, C.V. (2008b), *Climate change discourse of oil companies,* in *Proceedings of the QIEI 2008 International Conference on Quality-Innovation-European Integration*, 2008, Department for Interchangeable Manufacturing and Industrial Metrology, Karlsplatz.

RISCURI ŞI CATASTROFE
Vol. VIII, Nr. 6 / 2009