Changing energy markets, global climate change and the role of EU, Russia and CIS countries and China

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1 Introduction

The aim of this paper is to present the recent development in the geopolitical constitution of energy security in the EU and in Russia and CIS countries in the light of the climate change regulatory framework and also with respect to the increasing energy demand from Asian developing countries – namely from China.

The paper is divided as follows. Firstly, the position of developing and developed countries towards the climate change issues is summarized, secondly, we describe the interrelation between energy security and climate issues and thirdly, we focus on the importance of Russia and CIS for the EU and the impacts of Chinese aggressive "green" strategy, which redirects the natural gas sources from Siberia from EU to China.

2 Climate change – EU, China, Russia

According to expert estimates the global level of emissions has to be halved by 2050 (compared to 1990) to avoid the risk of irreversible climate changes[2]. One of the key issues of the global climate change action is to set mid-term targets for more or less strictly defined greenhouse gas emission limits until 2020. Whereas the developed countries suggest cutting their greenhouse gas emissions substantially (leader is in this respect the EU) and pledged fixed targets to be fulfilled until 2020, the developing countries such as China and India are perceived to be the future largest polluters, they themselves feel substantially less responsible for the current state of greenhouse gases in the atmosphere. They argue to record lower emission levels per capita and even though most of them already committed on domestic level to implement actions to enhance their energy efficiency and expand their renewable energy capacities, neither of them has agreed to formalize such commitments on the international level.

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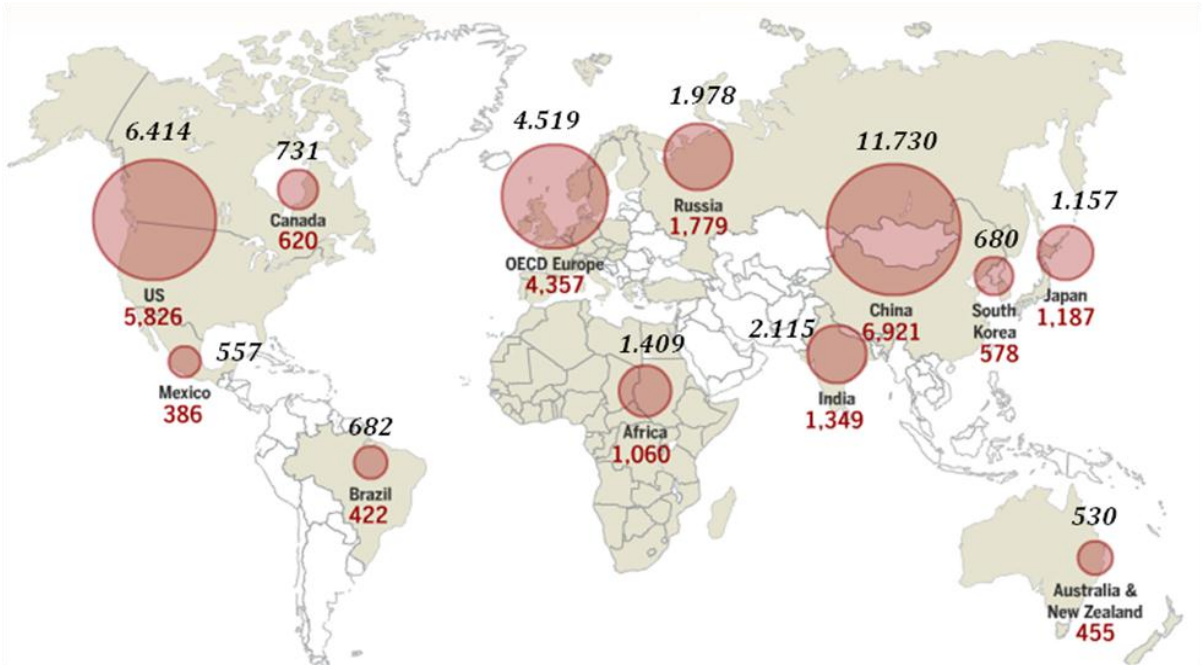
2 Irreversible climate changes are estimated to occur in case the global temperatures would rise by 2°C above the pre-industrial levels.

Figure 1 – Annual emissions in 2009 (red numbers) and estimated for 2030 (black numbers) in metric tons of CO_2; excluding land usage

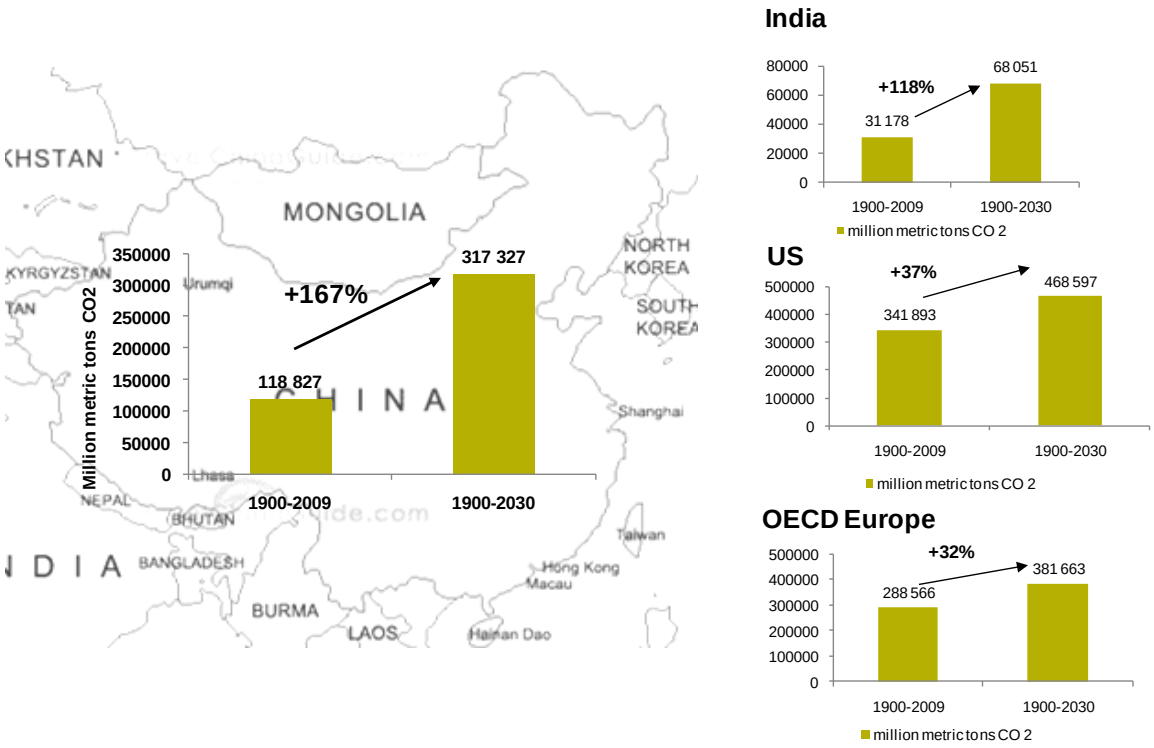


Source: EIA, US Census Bureau, FT Research

Looking at the position of the key players in the climate change framework, European Union is the biggest supporter of the Kyoto protocol and it is one of the few signatures of Kyoto that is able to meet its targets under the UNFCCC Treaty. EU and EU companies profile themselves as leaders in the market with environmental technologies and thus benefit from the EU position to climate change initiatives. The strongest counterpart of the EU is China, which produced 6,921 metric tons of CO_2 solely in the year 2009 and became so the world's biggest polluter (Figure 1). Even though China produced in the run of the twentieth century just around a third of the amount of greenhouse gases produced by the US (Figure 2), it is expected to increase its annual emissions by further almost 70% in the next 20 years and reach the level of 11,730 metric tons of CO_2 emitted in 2030 - a pace 7 times higher than the pace of US (10% increase until 2030 compared to 2009) and almost 19 times higher than of the OECD Europe. Nevertheless, due to the unprecedented boom of Chinese economy, the country slowly starts to get "green". This means that China focuses strongly on environmental friendly technologies (it is one of the leading exporters of solar panels, wind turbines and some other machinery and components that are favorably been used as tools helping to enhance energy efficiency) and on clean fuels – e.g. natural gas, which it imports from Russia and CIS countries.

Even though Russia's emissions grew between 2000 and 2007, they grew incommensurably more slowly compared to its GDP, by just 1% per year. Before the crisis they had, according to WWF Russia, reached 66% of the 1990 base level. This proves that decrease by 25% is essentially a raise compared to the current level. Furthermore, in earlier discussions former President Putin used to stress the point, that targets set should reflect potential of the Russian forests to absorb a substantial part of the produced emissions.

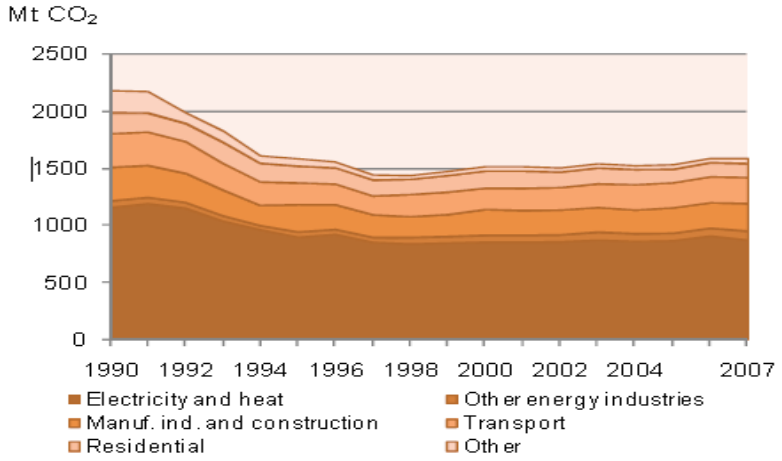
Figure 2 – Increase in cumulative emissions in China compared to other key countries



Source: EEIP according to FT Research

The situation of Russia is compared to other countries fixing absolute levels of emission pledges rather extraordinary. Russia offered to cut emissions initially by 10-15% until 2020, later the Russian representatives grossed their offer up to 25% in case other countries co-operate. Similar as EU and Japan, the baseline year was set to 1990. However, the baseline was the year when the Soviet bloc collapsed, resulting in their highly energy inefficient industries undergoing deep structural changes in the run of the early nineties. As the level of Russian greenhouse emissions was 34% below the 1990 levels in 2007 (Figure 1), offered targets would in fact still allow Russia to raise their emissions substantially, by experts estimates by 31-38% compared with 2005 levels.

Figure 3 – Development of CO_2 emissions in Russia (according to sectors)



Source: IEA

As was already suggested and depictured in Figure 1, Russia and CIS countries benefit from increasing environmental awareness in the EU, which is the traditional buyer of their natural gas, but also from development in China, who becomes a powerful global buyer of energy commodities.

China inaugurated its first transnational oil pipeline in May 2006 when it began receiving Kazakh and Russian oil from a pipeline originating in Kazakhstan. The new 200,000 bbl/d pipeline connects Atasu in northern Kazakhstan with Alashankou on the Chinese border in Xinjiang. The pipeline's third leg from Kenkiyak to Atasu and an expansion of the entire pipeline, doubling capacity to 400,000 bbl/d, are to be completed in 2011. The new pipeline from would also connect with Russian crude from western Siberia.

Construction of another oil pipeline - Eastern Siberia-Pacific Ocean Pipeline (ESPO) - was launched in April 2006. The pipeline shall channel crude oil imports from Russian Far East to China. The pipeline will span 2,972 miles from the Russian city of Taishet to the Pacific Coast. The project shall have two stages. The first stage of the project includes the construction of a 600,000 bbl/d pipeline from Taishet to Skovorodino and is expected to deliver for 20 years (beginning in 2011) about 300,000 bbl/d to the Chinese border. Furthermore, another 597-mile pipeline should link the spur with the Daqing oil field in the northeast. In the future, a second phase should extend the pipeline from Skovorodino to Kozmino Bay on the Pacific Coast, which is expected to accommodate Russian crude oil exports to both China and Japan. However, the second phase of the ESPO is not likely to be commissioned until 2015 or later.

In 2007 China produced 2,446 Bcf of natural gas while it consumed 2,490 Bcf, and for the first time in almost 2 decades, China became a net natural gas importer (importing LNG to fill the gap)[3]. Although China has accelerated the domestic production of natural gas, which has increased by app. 18%, its import dependence is expected to increase rapidly due to rising gas demand. Majority of the gas consumption is dominated by industrial users[4] (app. 40%), the recent growth of gas consumption in the past few years is, however, attributed to all sectors. Beside the expansion of industrial use (including the petrochemicals industry and the power sector) the penetration of city gas together with the progressing urbanisation has been the driving force behind this high-paced increase in demand. The government has enhanced natural gas use through policy and regulation, and by developing infrastructure. In future, it is expected that future gas growth will be led by the power[5] and residential/commercial sectors[6].

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[3] Until the start of liquefied natural gas (LNG) imports, China was self-sufficient in terms of natural gas.

[4] With the exception of its own consumption in the energy sector, which uses gas mainly for the development of oil and gas fields, the chemicals and petrochemicals industries are major natural gas consumers in China's industrial sector.

[5] Although natural gas consumption in the power sector is steadily increasing, it represented only an 11.6% share in total gas consumption in 2007 even when the government has been promoting the use of natural gas in the power sector from the viewpoint of energy efficiency and environmental benefits. Until now, the government has implemented a number of reforms regarding coal prices, including a regulation for the desulfurization of coal-fired power plants, with restricted sulfur emissions. Power price reform was also implemented including such measures as the adoption of peak and off-peak pricing systems and the linkage of power prices to coal prices. However, those adjustments have not sufficiently changed the competitiveness of natural gas so far. In 2009, following the drop in oil prices, international gas prices also began to decrease but were still more expensive than coal prices in China. Moreover, it seems to be difficult to increase power prices given the current economic recession. The relative price issue between coal, natural gas and electricity remains a key challenge for the expansion of natural gas use in China's power sector.

There are two key factors that influence deployment of natural gas in China – necessary infrastructure and natural gas prices. Concerning infrastructure, until recently, natural gas was primarily used as a local fuel or as a feedstock in chemical fertilizer. This was mainly due to the lack of infrastructure, particularly long-distance pipelines connecting inland gas fields to major consumer cities, mostly in the coastal areas in China. Nevertheless, China has made several significant investments (West-East pipeline, Central Asia pipeline, LNG regasification terminal in Guangdong etc.) in order to be able to deliver the commodity to customers. As far as the natural gas price is concerned, the Chinese government has been carefully considering setting a price level in order to promote natural gas use as a substitute for coal. Consequently, China's domestic prices for natural gas are far cheaper than international prices. Until 2006 the impact of the differential between domestic prices and international prices has been limited because China's import dependence ratio has been low. However, China's imports of natural gas are expected to increase rapidly, which implies that China's current price regime should be modified in the near future.

The expansion of China's presence as an importer will be one of the key factors in the future of the international market of natural gas. China's demand-supply balance, its pricing policy and security strategy may directly affect the Asia-Pacific LNG market, and the European gas market indirectly, through pipeline gas imports from Central Asian countries and possibly, in some years, from Russia. This suggests that the EU will be very soon fiercely competing with China for low-carbon energy sources – such as is natural gas and also – potentially – uranium (given the Chinese plans to increase the share of nuclear power on its energy production) and bioethanol/biomass.

All the above stated threats shall be taken into account and included into energy policies by the EU, individual Member States and also by European energy companies, because otherwise it could happen in the future that the EU will lose its competitiveness on the global energy, carbon and environmental-friendly technologies markets.

3 Conclusions

This report analyzed the interrelation between climate change policies, shift of the demand on energy commodities to Asia (namely to China) and the impacts this has on the EU, Russia and CIS countries. Whereas for the EU, the climate change policies in combination with Chinese progressive strategy in securing supplies of energy commodities and re-orienting the economy to environmental friendly technologies, become more a threat than an opportunity, Russia and CIS countries may benefit broadly from this development.

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[6] The residential sector is the fastest growing sector in terms of gas demand - residential gas consumption increased dramatically from 3.7 bcm in 2000 to 17.7 bcm in 2007 – an annual increase of 25%. Until the late 1980s, coal and coal gas were primary fuels even for city residents in the country. Then LPG became used for communal cooking and water heating fuel in several cities. The natural gas use in the residential sector has accelerated since 2005 because the natural gas price remained relatively cheap while the LPG price rapidly increased. At present, the government is placing the top priority of natural gas use in the residential sector, and is planning to increase the number of cities using gas, with a target of 65% urban penetration by mid-century. Natural gas use in transportation is also being promoted. (www.eia.doe.gov)

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