ПАРИЖСКОЕ СОГЛАШЕНИЕ ПО КЛИМАТУ КАК ОПРЕДЕЛЯЮЩИЙ ФАКТОР БУДУЩЕГО МИРОВОЙ ЭКОНОМИКИ И ПОСЛЕДСТВИЯ ДЛЯ РОССИИ

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АННОТАЦИЯ

Парижское соглашение по климату стало дополнительным стимулом развития экологически чистой энергии. Проблема изменения климата побудила наиболее развитые индустриальные страны увеличивать долю возобновляемых источников энергии в энергобалансе. В статье рассмотрен вопрос предстоящих изменений в секторе энергетики на мировом уровне и их последствий для России. На сегодняшний день сохраняется высокая зависимость российской экономики от сырьевого экспорта, что препятствует ее полноценному развитию. Угольная промышленность страны терпит значительные убытки, тогда как на мировом уровне прогнозируется снижение доли угля в энергетическом комплексе. В этой связи представляется необходимым пересмотреть планы Российской Федерации по увеличению добычи угля и строительству новых угольных электростанций на период до 2030 г. Страна обладает как природными, так и технологическими возможностями развития возобновляемых источников энергии, прежде всего, гидроэнергетики, потенциал которой в настоящее время недоиспользован. Развитие экологически чистой энергии в России представляется благоприятным для экономики, осуществимым и необходимым для выполнения взятых на международном уровне обязательств, связанных с изменением климата.

Ключевые слова: чистая энергия; изменение климата; угольная промышленность; возобновляемые источники энергии.

THE PARIS CLIMATE AGREEMENT AS A DETERMINANT OF THE FUTURE GLOBAL ECONOMY AND ITS IMPLICATIONS FOR RUSSIA

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ABSTRACT

The Paris Climate Change Agreement has become an additional incentive for clean power development. The global warming problem has encouraged major economies to ramp up renewables share in the energy mix. This paper discusses the issue of a forthcoming transformation in the global energy sector and its implications for the Russian Federation. The Russian economy remains highly dependent on raw materials exports, which

hinders its proper development. The country's coal industry faces large losses, while the coal's role in the power sector at a global level is forecasted to diminish. For this reason, Russia's plans on increasing the coal production and launching new coal-fired plants until 2030, for which purpose large sums are laid out, should be reconsidered. The country, in turn, has a natural and technological potential in developing renewables, mainly hydropower, which is underutilized nowadays. Clean energy development in Russia is viewed to be beneficial to the economy, feasible, and crucial for meeting climate change-related obligations declared at the international level.

Keywords: clean energy; climate change; coal industry; renewables.

The Paris Climate Change Agreement, which was signed by 195 countries in Paris in December 2015, came into force on 4 November 2016. It is considered to be the result of a complex international negotiation on climate ever taken place. The agreement's goal is to limit global warming below 2 °C and as close to 1.5 °C as possible to prevent the dangerous climate change consequences [7], among which are droughts and desertification, sea level rise leading to floods, and more frequent storms. All of these impacts threaten vast territories of our planet and people living there. Despite the skepticism questioning global warming as a phenomenon and as a threat to future generations, it has been agreed on the international level that it is not a 'hoax' (as it was called by the recently elected president of the United States Donald Trump [21]), but a reality. In this view countries, which signed the Paris Agreement, had submitted official documents called internationally determined contributions (INDCs) that contain pledges to curb greenhouse gas (GHG) emissions by particular rates as compared to baseline years by 2030 and information on how they plan to achieve these goals. Russia, one of the top world's emitter, has pledged to limit anthropogenic GHG emissions by 70–75% of 1990 levels [20, p.2].

With the negotiations initiated before the Agreement and with signatures of the countries' representatives affixed last year it became clear that the path of the world economy's development started to and will be changed. For the reason that the energy sector globally accounts for at least two-thirds of greenhouse gas emissions (according to the International Energy Agency, IEA [11, p.1]), the new climate change agreement focuses on measures related to clean energy development, with energy efficiency and renewable energy resources as the key tools. It implies that a transformation of the energy sector is a global trend of the near- and mid-term future. The time frame forecasted for this process by the latest World Energy Outlook, published by the IEA, is from nowadays up to 2040.

For the purpose of being more specific, the energy efficiency tools across different economic sectors are recognized by the author (following the extensive analyses in literature) as the primary (with which countries will start their lower-carbon pathway) and highly effective measures to tackle the emissions problem and are not discussed in details.

The transformation required to meet climate-related targets and pledges is to hit the coal industry firstly and to the greatest extent compared to other fossil fuels. Freezing coal-related projects was widely discussed at the Paris conference. Plans on a large-scale[1] construction of coal-fired plants remain in four countries — Vietnam, India, Indonesia, and China [13]. However, China, which is the world's largest emitter of carbon dioxide (CO_2) and has a significant impact on the international coal market, reduced its import of power generation coal by 32% in 2015 compared to the previous year [18, p.27]. The decline in China's coal consumption is considered to be the main driver of the global carbon intensity (emissions per unit of GDP) fall to record lows in 2015 [14]. The country, having pledged to cut its emissions by 60–65% from 2005 levels by 2030, has begun to close some enterprises in the cement and steel sectors that highly rely on coal as a source of energy (such measures are incorporated into its new Five-Year Plan). The IEA forecasts a 15% decline in China's demand for coal over the period to 2040 and a fall of the coal share in the country's power mix [11, p.7]. According to the World Energy Outlook 2016 coal demand in the European Union and the United States is also to decrease by 60% and 40%, respectively, over the period of 2040.

It is worth mentioning that moving to clean power meets a strong opposition from the coal industry's

[1] Significant at a global level.

entities. An illustrative example is the blocking of the Clean Power Plan (CPP) initiated by Barak Obama and elaborated by the Environmental Protection Agency (EPA) for the purpose of lowering carbon emissions from American power plants by 2030 to 32 percent below 2005 levels and serving as the main tool to meet the pledges under the Paris Agreement. Announced on 3 August 2015, the CPP was put on hold by the Supreme Court on 9 February 2016, questioned by a 27-state coalition led by coal-producer West Virginia. Remarkably, an analysis carried out by the Environmental Defense Fund shows that 21 of the states opposing the Plan can actually meet interim goals during the first three-year compliance period and 18 of them can achieve the final goals scheduled for 2030 [6].

Turning to other fossil fuels, Head of the Climate and Energy program of World Wildlife Fund (WWF) Russia Aleksey Kokorin believes that the Paris Agreement will unlikely affect the oil industry, however pointing to the fact that even oil-rich Saudi Arabia expressed its understanding that there would be an end to the oil era eventually. Moreover, Saudi Arabia has prepared and launched its reform program called "Vision 2030", which encompasses energy efficiency and scaling up of renewables in the electricity provision. IEA expects growth in oil demand to slow over the period of 2040 but it will be as high as 103 million barrels per day [11, p.1].

Numerous experts view the impact of the Paris Agreement on the gas industry as a positive one. Indeed, the World Energy Outlook 2016 forecasts a 50% rise in demand for natural gas by 2040 and its expanded role in the global energy mix.

The new climate change treaty has added momentum to the development of the renewable energy sources. World production of renewables reached 1,894 Mtoe[2] by 2015, representing 13.8% of the total Primary Energy Supply [10]. Starting from 1990 energy from renewable sources has grown at an average annual rate of 2.2%. Growth has been especially high for solar photovoltaic (PV) and wind power driven primarily by OECD countries and China. Renewables are now the second largest source of global electricity production, accounting for 23% of world's generation in 2015.

Investments into renewables were back to the growing path in 2015 after decline in 2011–2013 amounting to $286 billion with China, USA, India, and Japan being the key investors [3]. It is forecasted that there will be a significant reallocation of capital towards renewable energy (20% of $44 trillion, cumulative by 2040) given the expectation of continued cost declines for key renewable energy technologies. IEA predicts average costs for solar PV to fall by 40 to 70% by 2040 and for onshore wind by 10–25%. The share of renewables in the global new power generation to 2040 is projected to be 60%. While renewables are supported by subsidies standing at around $150 billion today (bear in mind fossil-fuel consumption subsidies estimated to be $500 billion in 2014 and dropping to $300 billion last year), the former should be competitive without the latter by 2040. Notwithstanding the positive forecasts for the renewable energy sector it is important to consider that it is capital intensive (where the majority of investments are up-front in contrast with fossil fuel capital, which is spread during the life-cycle of a plant) with longer payback period and risks related to technology.

The provided above figures as well as plans of the largest economies, such as the United States and China, presented in their submitted INDCs, make it clear that a new pathway of the energy sector is created. New markets will evolve; trade patterns will be changed with coal stepping away and renewable energy technologies gaining weight. International Renewable Energy Agency (IRENA) warns that fossil fuel exporting countries will see a reduction in the demand for their exports followed by decrease in GDP [12, p.25]. Larger impacts on national economies are to be felt by countries with the largest share of fossil fuel exports in GDP. IRENA names Saudi Arabia and Venezuela (with oil exports amounting to 25% of GDP) plus Nigeria and Russia (15% in each) as countries to suffer losses.

The statement of the Deputy Minister of the Economic Development of the Russian Federation Nikolay Podguzov about the threat of ignoring a new global development path to the Russian economy that was expressed at the Saint Petersburg International Economic Forum 2016 [4] is consistent with IRENA's message. A danger of becoming an outsider of the world trade within the framework of a new reality characterized by a low-carbon development and new markets of renewable energy technologies should be one of the main drivers for the decision-makers to bring the Russian economy to transformation. It represents a missed opportunity, in other words. Di-

[2] Million tons of oil equivalent.

rector of WWF Russia Igor Chestin has noted this June that renewables are a large business, which is developing and where Russia is not participating. Another reason for caring is that Russia's main trading partners could potentially introduce CO_2-related trade restrictions on countries that do not participate in GHG abatement measures. Apart from this, a factor of international reputation plays an important role. McKinsey & Company states that due to the fact that Russia is the world's fifth largest emitter of greenhouse gases (5% of global total as of 2012), its actions on climate-sensitive topics receives a great deal of attention [15, p.9]. The energy sector accounts for around 80% of the country's GHG emissions (2012 data of the United Nations Climate Change Secretariat) [19]. It would be beneficial, at least for the purpose of drawing attention of the public and politicians to the problem, to focus on dangerous health impacts of the emissions; however, risks to companies involved, budget, and to the whole economy represent much greater monetary losses and hence become the center of existing analyses and disputes. According to the data provided by the Russian Ministry of natural resources and environment losses from climate change impacts in Russia amount to 60 billion rubles per year. Mr. Kokorin from WWF Russia notes that if actions to tackle the issue are not undertaken, the figure will increase by at least 10 times in a 15-year period [13].

Clean power path represents a chance for the Russian economy, which has already traditionally been highly criticized inside and outside the country for its high degree of dependence on raw materials. Blessed with large stock of natural resources, the country has been slow in diversifying the economy. Exports of commodities represents more than 40 percent of the budget income[3]. The second year of oil prices decline has led to Russia's budget deficit soaring to maximum during the last six years. Moreover, in view of the possible freeze of the volumes of oil extracted by OPEC and other largest producers Russia has ramped up its monthly production to historical (in the post-Soviet period) record of 11.2 million barrels per day in September. Economic and welfare growth have been directly associated with oil and other raw materials exports. However, studies reveal that this link wanes. For instance, a group of Russian economists on the topic prove this statement by giving example of the United States, where real GDP grew 2.5 times in 2014 from 1980 figures while oil consumption rose by only 11 percent for the reason that economic growth is ensured by energy efficient sectors [1]. They argue that neither does a decline in price make oil more attractive for consumers.

The problem is exacerbated by the current negative dynamics of the Russian commodities exports value. The value of commodities exports, which represent 39% of all exports to former Soviet Union countries and 63% to other countries, plunged by 36% to each destination [2].

Coal industry is one of the Russian economy's sectors sensitive to price changes in the international markets. Russian Federation ranks third in the world after Indonesia and Australia by export volumes. Exports of energy coal continued to grow in 2015 (amounting to 137 million tons) with production hitting record maximum of 372 million tons in the post-Soviet history [9]. But these impressive figures bear an attempt to solve the existing problems that the Russian coal industry faces currently. Export prices for Russian energy coal in USD have fallen by 1.6 percent over the past five years, and prices for coking coal by 2.2 percent over the same period. Despite devaluation of the Russian currency, prices in rubles have also tumbled. Many coal companies have incurred large losses. The share of loss-making companies in the sector was 31% in 2015 [16]. Due to a high level of debt load in the industry dollar exchange rate growth aggravated the situation. According to the data provided by Minister of Energy Alexander Novak at a meeting chaired by Russian Prime-Minister Dmitriy Medvedev in the Kemerovskaya region in April 2016, investments into fixed capital contracted twofold.

For the reason that coal is the dirtiest in terms of emissions from fossil-fuel combustion, it should be the first and main sector for massive modernization and cuts of share in the energy mix. Coal accounts for around 18% of electrical power generation in Russia but this share is projected to rise. The share of coal in fossil fuel consumption is to increase to 44% according to some sources [8]. A state program on the Russian coal industry development up to 2030, which came into force in 2014 and totals 5 trillion rubles (6% of which coming from budget outlays) [5], includes plans to launch new coal-fire power plants. 92 percent of the budgetary funds are to be allocated to meet the objective of developing the

[3] Vestifinance. Russia receives $6 billion during negotiations with OPEC. 17.11.2016. URL: http://www.vestifinance.ru/articles/77740 (Accessed: 18.11.2016).

internal market and strengthening Russia's positions in the world coal industry, which apart from other measures implies development of new fields. Only 1 percent of budgetary allocations will be related to environmental security. Given the above provided negative forecasts on the worldwide, and specifically China's (on exports to which future Russian export volumes highly rely), demand for coal and its use as well as Russia's pledges on curbing emissions, it seems appropriate to reconsider the coal industry development plans in the Russian Federation over the period of 2030 avoiding losses from ratcheting up coal production and increasing amount of coal-fired power plants and to reallocate budgetary and other financial resources to clean energy.

Reallocation of capital towards renewables is reasonable because of a high potential of their development in Russia. The potential mainly lies in hydropower. The Chief Executive Officer of a large private company EvroSibEnergo Vyacheslav Solomin noted this June at the Saint Petersburg International Economic Forum that the hydropower potential is employed by less than 20% [17]. Mr. Solomin points to the fact that by means of rivers' energy Russia could cover four-fifth of its energy needs. Unlike wind and solar power plants hydropower can work both at a base load and at peak consumption periods; its cost of production is lower than for other renewables. However, perspective hydropower stations are located quite far from large centers of energy consumption in Western Siberia and Ural. For this purpose, Russia needs to either develop industries near hydropower stations or to develop technologies for the purpose of effective energy transmission at very long distances.

International Renewable Energy Agency sees an opportunity for Russia to develop and reap benefits from trade of bioenergy. Apart from this, Russian Federation has already developed unique technologies, specifically drill strings, that allow to produce geothermal energy, which is located in hot dry rocks and accounts for 99 percent of underground geothermal energy. The thermal capacity of this alternative source, which can also be developed in Russia, is thousands of times higher than that from burning of fossil fuels. Therefore, Russia has got natural and technological potential for raising the share of renewables in the total energy mix.

To sum up, the Paris Climate Change Agreement has given the signal and understanding that the global energy sector will be changing in the mid-term future with a diminishing role of fossil fuels and an increasing use of clean energy. There are several reasons, for which Russian Federation should follow this global pathway and the sooner, the better. Firstly, the Russian economy has been in a raw materials' trap for quite long without diversification that could benefit its GDP and total welfare. Secondly, high budget deficits caused by fluctuations in prices for oil, coal, and other key export goods hamper the country from providing public security services and financial assistance to the private sector. Thirdly, the country has made its pledges on an international level to curb greenhouse gas emissions and receives a high degree of attention due to being world's fifth emitter. Fourthly, missing the opportunity to trade in the new markets of clean energy technologies represents a loss of income that could contribute to the Russian economy's development. Russia has got a high natural potential for developing at least hydropower at the first stage. Investments are required for research and development and for installments of new power plants. Taking the current budget deficit into account, it seems feasible to reallocate the capital that is nowadays channeled to fossil fuels subsidies and that are provided for the purpose of realizing the state program of the coal industry development, which in turn should be reconsidered. Russian Federation has possibilities to meet its climate targets not only by forest management, which is declared as one of the main tools under the Paris Agreement pledges, but by modernizing its energy mix entailing future economic benefits.

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