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EURASIAN ENERGY CIVILIZATION

Regarding «Future Energy»

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The monograph deals with the issues of the new energy civilization as the next stage of development of humanity under conditions of globalization. The Eurasian energy civilization was chosen as the object of the analysis as it is the key link of the universal civilization process. The new energy civilization is envisaged as the next stage of this process based on expanded reproduction of the cumulative energy potential in the form of national (public) wealth of society and its efficient use. Its advent is conditioned by the objective need to ensure global sustainable development. The publication formulates conceptual approaches to the analysis and assessment of specific features of this phenomenon, as well as makes an attempt to understand the main mechanisms of its influence on global and regional processes of social development. Along with generalized statement of the main attributes and particularities of modern civilizations, the publication, using specific examples, characterizes the present state and predicted evolution of the world and Eurasian energy space taking into account the paramount civilizational importance of energy as an intrinsic element of formation and development of the human civilization in general. Besides, the publication considers issues of ensuring energy security in Eurasia and globally, as well as other pressing challenges and processes of development of the world energy.

The book may be of interest to engineering specialists, as well as political scientists studying the outlooks of international cooperation and sustainable development of the Eurasian civilization.

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*Our knowledge of the energy available
to the mankind is in infancy.
V.I. Vernadsky*

PREFACE

On June 10, 2017 the International Specialized Exhibition «Astana EXPO-2017» will be open in Kazakhstan. The core subject matter of the exhibition is «Future Energy». The project intention translated into the EXPO theme's subtitle: «Solutions for Tackling Humankind's Greatest Challenge.»

The statement that development and implementation of the most advanced energy use methods is a prerequisite of sustainable development is the starting point of the Future Energy project concept. It sounds abstractly and even as a commonplace. Platitude. But only until we realize that «future energy» as a civilization phenomenon includes both «past energy», and «present energy». In other words, «future energy» is based on previous achievements of the mankind, while the paths and outlines of its further development are determined by the present. The image of «future energy» and its actual embodiment will depend upon living and future generations.

Astana EXPO-2017 exhibition, as well as any similar event, pursues mostly practical, application-oriented goals. In this case – to draw public attention to energy resources as a necessary condition of existence of human civilization, on the need of their responsible and rational use. In particular, the point at issue is about solutions and methods of sustainable energy sources management. These solutions and methods are aimed at:

- stimulating the use of alternative energy sources, including renewable ones (RES);
- ensuring quality and reliability of energy supply;
- monitoring energy production, storage and use;
- providing general access to sustainable energy sources.

At the same time the motto of this exhibition – «Future Energy» – gives a reason for considering the problematics of the energy future in a wider context – against the background of civilizational development of the humankind, without being limited to just technical and organizational aspects. Under conditions of globalization this issue inevitably assumes all-civilization meaning. In particular the energy potential of future development

of the world is not only natural resources (hydrocarbons and RES), but also human capital in its sociocultural, intellectual and technological form.

Globalization in its current form provides for material and informational interaction of civilizations. The challenge of the living and future generations is to create spiritual unity of the mankind while preserving unique cultural bases of various civilizations.

Politics, economy, science, education, culture, finance, human resources - everything has become articles of commerce and exchange as various kinds of energy interaction in the world. Leading countries of the globalized world strive for leadership in the field of trade on a worldwide scale. Globalization does not create states and regions. It includes them in its process as they are due to geographical, political, economic, and social conditions. The idea of globalization of the consciousness of the mankind, cultivation of world mentality has also been gaining more and more a foothold. For example, the concept of duty, responsibility and obligations of people towards the world civilization, the mankind, the planet has been forming. A human starts thinking on a global scale, feels as a citizen of the world, the whole Earth becomes a homeland for him/her. But this process is long, not linear, with kickbacks, marking time, etc. Nevertheless, the said vector appears to be an inevitable consequence and a driving force of the world civilization development on the basis of aggregated energy potential and its implementation in the course of the society's life.

The subject of the «future energy» considered in the context of globalization makes it possible to include it in the so-called «energy civilization» system.

The «energy civilization» concept appeared in publications quite recently and has not taken roots among experts yet. Nevertheless, its introduction into scientific vocabulary seems to be justified. The energy civilization of the 20th century meant a focus on extension of production and creation of huge energy systems where a person was not even an active consumer, but an element of the machine system. In the 21st century the resource potential is no longer a significant restrictive factor as new technologies open doors to the use of new nonconventional natural energy resources, and increased energy efficiency reduces total requirement for them for achieving the target. It is just in the 21st century the time has come for the forming of a new energy civilization as the means, subject and purpose of sustainable development of the common Earth House of the humankind – Είκος. Thus,

a new energy civilization may be considered as the next stage of the all-civilization development of the humankind based on expanded reproduction of the cumulative energy potential in the form of national (public) wealth of the society and its efficient use. Its approach is conditioned by the objective need to ensure sustainable global development. When being at the initial stage of shaping of a new energy civilization, it is important to formulate conceptual approaches to the analysis and assessment of specific features of this phenomenon, as well as to understand the main mechanisms of its impact on global and regional processes of social development.

Characteristic features of the new energy civilization are interrelated and dependent upon all-civilization trends inherent to the historical experience of energy development of various civilizations. From methodological and practical point of view, it is important to estimate adequately the degree of such interdependence to be able to develop proper recommendations for managerial decision-making at the level of national government institutions and international organizations. With this aim in view, this publication pays special attention to both global energy aspects, and to specific features of major civilization systems based on various principles of use of the resource and socio-humanistic potential.

Without claiming here exhaustiveness of coverage of the subject under consideration, the authors nevertheless believe that drawing attention to it in itself may be reasonably useful for clarification of forming vectors of development of the main entities of the Eurasian civilization and their interrelations and partnership, in particular for the purpose of ensuring sustainable global and regional energy development.

Considering the subject of the Eurasian Energy Civilization» in this publication, we are involuntarily forced to be limited to examples of only some – the most characteristic in our opinion – entities within geographical limits of Eurasia, such which determine currently or will determine in the next decades geopolitical (including energy-related) vectors of development of not only Eurasia, but to a much greater extent of the entire world economy and policy as a necessary and integral component of civilization processes.

We refer to such entities, first of all, the European Union (EU), the Eurasian Economic Union (EAEU), Russia and China. Such choice does not exclude at all the use of examples of other regions and international organizations, such, for example, as the USA, the Central Asia and the Middle East countries, the Shanghai Cooperation Organization (SCO),

BRICS (Brazil, Russia, India, China and the Republic of South Africa) and others.

This publication includes a generalized statement of the main signs and particularities of modern civilizations. Special attention is given – as it appears from the publication title – to the Eurasian civilization. Subsequent sections – using specific examples – characterize the present state and the forecasted evolution of the world and Eurasian energy space taking into account the fundamental civilizational value of energy as an intrinsic element of formation and development of the human civilization as a whole. The publication also deals with issues relating to the energy security within Eurasia and globally, and other topical problems and processes in the development of world energy sector.

In particular, analysing the concept of «energy security», the authors draw attention of the reader to the Russia's contribution to its development, to the role of the Advisory Meeting «Russia – Europe: Energy Security Strategy» (organized by the Security Council of the Russian Federation in Moscow on June 6-7, 1995) in this process. It was on that Meeting, in the report of the Minister of Fuel and Energy of Russia Yu.K. Shafranik, that the energy policy of Russia, including energy security matters, was presented from the point of view of the uniform Euro-Asian energy space – for the first time at such a high level.

This approach was further developed in the Conceptual Draft Eurasian Energy Doctrine prepared in 2013 by the Institute of Energy Strategy (Russia, Moscow) and the Institute of Economic Research (Kazakhstan, Astana). Developed as a public consent document, the Doctrine contains a system of insights into development of the energy sector of member states of the Common Economic Space (CES) and defines strategic objectives, tasks, priorities and principles of the Eurasian energy integration as an infrastructure basis on the way of formation of the uniform Eurasian energy-and-economy space.

1. A NEW ENERGY CIVILIZATION AS THE NEXT STAGE OF DEVELOPMENT OF THE HUMANKIND IN THE CONTEXT OF GLOBALIZATION

The science does not provide a generally accepted and entrenched definition of civilization. Neither is there consensus among experts as to how many civilizations were there and are. Though there is a huge amount of scientific literature on this matter, new researches appear now and then. The range of opinions and wordings is extremely wide, including, without limitation, civilization of «cultural humankind» of V.I. Vernadsky [1, page 33]; opposition of the concept of «civilization» to the concept of «barbarity» by French philosophers of the 18th century; the concept of «civilizations» as the highest cultural value by S. Huntington [2]; publications of L.N. Gumilyov [3]; at last, numerous publications on modern civilizations by A.G. Dugin of [4] and many other authors [e.g. 5]. Selection of specific features as characteristic ones of a civilization (each author has his own list) explains also the dispersion of opinions as to the number of civilizations or groups of civilizations – from several tens to three/seven. Any attempt to reduce different definitions to one, taking into consideration to the fullest extent various aspects of a civilization as a worldwide phenomenon, would be obviously not only hopeless, but also senseless, because the civilization process in the formation of the humankind is so multidimensional, diverse and – primarily – unstoppable that no list of its «specific features» (inevitably subjective) could be recognized more or less complete (let alone exhaustive and steady).

Nevertheless, an approach from a «civilization» point of view is in itself a reality of life. And from purely practical point of view we cannot do without certain terminological tools in the analysis of any subject, phenomenon or process. For the purpose hereof, «civilization» shall mean an aggregate of tangible (material, financial and economic), as well as intangible (spiritual and humanitarian, informational and intellectual, institutional and social) assets (public wealth) and the potential of human community at a certain stage and/or under certain conditions of its development. At the same time the civilization is both historical-and-geographical and cultural-and-technological community which is characterized by availability and level of use of its energy potential: not only natural and production one, but also mental, and historically determined one. This potential is developed in the

course of evolution of the respective civilization and determines its further ways and possibilities of development.

However, we realize incompleteness and potential vulnerability of the offered definition. The concept of «civilization» should be correlated not only to human community, but also to the system of its relationship with its social and natural environment. This relationship has, first of all, energy-dynamic character. Thus, the given definition of a civilization emphasises an active role of energy in expanded reproduction of the human society's potential in general and in sustainable development of its most active groups (ethnoses, nations, people) [5, pages 113-114].

So we logically come up to an expanded definition of a civilization as «an energy-based system of life activity». The energy sector as a life support system ensuring proper activity of society is based on the use and expanded reproduction of available energy potential and represents a basis of civilization. From this point of view in the today's world it is possible to distinguish at least three civilization systems (not separate civilizations!): the North Atlantic civilization system (with dominance of individualism and capitalism in its classical understanding), the East Eurasian civilization system (with dominance of natural potential and collective forms of living) and the Middle Eastern civilization system (with dominance of a religious and communal form of world perception) [6, page 7].

Within the framework of these big systems the energy civilization – as a set of public (tangible and intangible) assets of humankind in its ecosystem in the form of its energy saturation, considered as a condition of being and as a potential of sustainable development – has been being formed. And the view of energy development of the world will not be the same for various civilization systems.

The energy industry is an infrastructural base of development of the world civilization. Harmonious development of the «nature-society-human» system requires an integrated energy-ecological-economic approach. Key features of the energy industry of the 21st century include its close integration, and even convergence, with other spheres of life of society. Interaction of economy and energy industry become apparent in the increasing role of the energy industry in global social and economic development.

The energy industry is closely related to the policy which in many respects is determined by energy interests of states. And vice versa –

the development of the energy industry quite often depends on policy. This interdependence may be especially clearly seen recently. Under the influence of geopolitical factors, the new architecture of world economy and international relations has been being formed, we witness a return to the policy of balance of forces and power policy (including soft one). Local and international military conflicts, coups d'état, mutual economic and political sanctions, etc. shape the modern energy world, determine the condition of energy markets, as well as the destiny of largest energy projects. That way, the energy industry once again has become a factor of political ambitions, tactical targets and decisions taken. And this is despite the fact that under such conditions it becomes more and more difficult for the energy industry to perform its main task – to ensure uninterrupted, reliable and efficient supply of consumers with fuel and energy, as well as to create conditions for expanded reproduction of the sustainable development potential.

As we noted hereinbefore, the new energy civilization is the next stage of sustainable development of the humankind. Speaking about phenomenon of new energy civilization, we assume that further world development will rely on two major processes – industrialization of developing countries and post-industrial development of developed countries. These two processes will result, perhaps as early as in the 2030s to the completion of the industrial paradigm of development.

Not simple reindustrialization, but neoindustrial development becomes a new form of productive activity. To replace physical, and then machine work, «human-machine» or so-called ergatic production comes. But in a neoindustrial society a human will remain a creative and active person [7].

Long-term trends of world economic and energy development make it possible to expect during the period till 2050 formation of a new energy civilization. We may foresee an exit of the world energy industry from the hyperbolic growth mode and its movement towards respective changes of its quality characteristics. Transition to a new energy civilization manifests itself in an increasing convergence of the energy industry with other spheres of economy and development of society. A well-known «boom» in the field of renewable energy became one of signs of the shift towards a new energy civilization. Crisis phenomena in the present-day economy made it possible the emergence of a new energy civilization based on the energy efficiency in its generalized understanding. It is energy efficiency that becomes an essential element of a new energy civilization.

The main changes in the world energy industry – as it is predicted – will have an information-and-technology character. In this context geopolitical and regulatory factors may be put on the back burner. As a result there will be an energy industry of a new type – neo- and post-industrial one, based on non-carbon energy sources (renewable and atomic energy), there will be complex real-time energy consumption management systems with the use of decentralized sources, with energy industry integration into the technosphere, with an advanced energy saving. Conceptually new energy sources may appear [8].

Although this is the future, the foundation for this future development is laid nowadays. It is evident both in the development of strategic energy policy of states and international communities, and in practical implementation of this policy.

Development is an inevitable structural transformation. Change of the development paradigm, in particular through transition from purely industrial to socio-humanistic evolution, is accompanied by opposition of civilizations based on resource, human and intellectual development, which shows up in attempts to relegate the opposing party to the background in the world process, and even to destroy it. Attempts to globalize the world by inoculating uniform multicultural values of community life, state structure and social and economic system (and this in the «western» interpretation of these concepts) did not crown and could not be crowned with success. Disregarding natural, geographical, historical, mental, economic, cultural and other particular features of countries and people belonging to different civilization systems leads to a confrontation of civilizations rather than to their partnership.

However, a need for another vector of development, based on social humanism, has become more and more burning in the world. It stipulated integration of a personal cultural-and-spiritual basis and a collective form of organization of community life of people. These principles are more inherent to the East Eurasian civilization. It unites peoples of both former Soviet Union, and neighbouring states by similarity of all-civilization and historical ways of development [8a].

In other words, confrontation and conflict of civilizations have to be replaced in the long term by mutually advantageous and complementary partnership. We mean here objective dialectic interpenetration of civilizations. Unsuccessful (hopefully temporarily) attempts of building a multicultural

society in Europe serve not only as a lesson, but – first of all – as an incentive for searching suitable ways leading to a deeper integration of foreign cultural elements alien to the European people and their melting in the all-European civilization boiler which, in its turn, will also undergo changes. This process requiring a long time (may be, a change of several generations) will be inevitably accompanied by a change of root mentality of both European people, and representatives of other civilizations which are integrated into the European territorial, social, economic and cultural community.

Such a process which is not limited just to Europe, but takes place with a bigger or smaller depth also on other continents, testifies that modern civilization is a specific stage of spatio-temporal association of nations for the purpose of creation and development of common energy, cultural and technological identity. This process may proceed along different ways: from integration of countries and people into economic, cultural, geopolitical and other, including energy, unions, to the search of new forms of voluntary association into self-controlled public structures.

Modern process of all-civilization development proceeds against the background of globalization representing a worldwide phenomenon¹. The globalism became a phenomenon of our days. No one sphere of life activity of a human can stay away from its influence, and historical results of this activity in general will be inevitably evident. Their totality is embodied in the modern level of material and spiritual achievements of the world energy civilization. And globalization itself is a contradictory result of development of civilizations.

- Globalization sharpened such key and crucial issues of the humankind, as:
- the need of elimination of the threat of the world nuclear and information war;
 - deep contradictions between scientific and technical progress and the nature;
 - total dehumanization of society and personality;
 - deepening of social and economic differentiation on the planet;
 - increasing manipulation by public opinion by means of mass media;
 - commercialization and unification of cultural values and, as a result, impoverishment of the inner world of people [9, page 20].

The wrong side of globalization in its present forms is separation of people into those who uses its benefits, and those to whom they are inaccessible. We

¹ Globalization issues will be considered in more detail in section IV.

are not going to assess pros and cons of globalization. But this process has to be performed so as to meet the interests of most people. Instead of speaking about increasing the number of trade agreements and elimination of trade barriers, we would better reflect on another model of the globalization process: moderately open world economy compatible with democratic standards, which vary depending on the country. Only in this case we may speak about leading role of human and social capital as a potential of world development.

On the one hand, globalization is a powerful tool for using socio-humanistic potential of life activity and sustainable (energy) development of a civilization. On the other, this potential is suppressed by the countries which took the lead on the way of economic development and do not want to have poor and developing countries as competitors.

Inconsistency of the growing globalization process shows itself in particular in the fact that it narrows capabilities of governments of some countries to respond to requests of their citizens. Sometimes it is even convenient to governments to explain the need of participation in competitive struggle, introduction of national restrictions, toughening of the taxation system, of employment standards, etc. by globalization. It is no coincidence that inequality of countries and nations is a primary subject of polemic among globalization supporters and opponents. Differences in status and potential capabilities of some countries would have benefit their common development under conditions of competition before become antagonists. Currently globalization negatively affects some countries by destabilizing them. At the same time globalization helps alleviating disparities between various countries. It already enabled some poor countries to develop quicker. And governments of those countries where inequality grows, objectively have tools in their stock to mitigate globalization effects. Instead they often invoke globalization to justify themselves instead of searching solutions. This is confirmed by examples of some Latin America countries.

Political changes, naturally, entail serious economic and technological shifts. The world economy of the last decades relied on forming of global value added chains – production facilities of end products were distributed all over the world, developing countries attracted them, which created economic globalization. As technology changes, the need for global coverage, and involvement of partners providing cheap natural resources and human capital decreases. Productions concentrate in countries and regions with highly qualified personnel, powerful scientific and technology schools.

Hence – the commenced process of return of earlier exported industry to the Western world, but on a new base naturally. For the time being mostly high-tech and expensive production concentrates in developed countries, but it is expected that as the production process cost reduces, manufacture of cheap consumer goods at robotized production lines will be also launched there. In this way, global production will become even more often regional. This process has been already named «glocalization» – when instead of expected disappearance of regional differences, they are preserved and strengthened, instead of merger and unification inverse phenomena emerge and gain strength, such as separatism, growth of interest in local uniqueness, old traditions, revival of dialects, etc.

A new situation is in evidence in the world: while the energy civilization of developed countries focuses more and more actively on the use of neotechnological intellectual capital, the other countries are forced either to follow the way of catching-up industrial development, progressively lagging behind the leaders, or to be oriented to their particularities – own natural resources and archaic methods of their use.

The «glocalization» process extends to all spheres of development – economic, social, cultural – and is characterized by coexistence of multidirectional currents and trends. However, it seems that this process perceived externally as a reaction to the boosted globalization, is actually one of its stages which will result in a deeper and comprehensive globalization which is not limited to just economy and policy, but considering mentalities and cultural roots of peoples of the world.

Development of human society is impossible without contradictions. Their movement makes the content of this development. The challenge is to manage to mitigate sharpness of such contradictions in due time, without allowing them to grow into conflicts disastrous for the civilization.

In the 20th century distinctions between civilizations began to influence more world policy (it is to be recalled that exactly in the 90th years of the last century S. Huntington's concept about «collision of civilizations» [2] appeared). However he meant mainly cultural and economic opposition. Today these factors matter not in itself, but from the point of view of their participation in formation of the general resource potential (natural, socio-humanistic, intellectual, technological one) of sustainable development of the humankind (i.e. of a new energy civilization). The world system found itself in a state when new management institutions necessary for

its development are not available. This translates into complication of intercivilizational relations. Global character of tasks for overcoming negative effects of globalization demands joint efforts of all world policy subjects involved in the sustainable development process. In general all types of energy civilization as integrated potential nodes of development represent unique structures. And each element of such structure, each separate nation or sociocultural community have, figuratively speaking, its own inherent «DNA», «genetic code».

An idea of human society as a single organism with identical energy potential and society life activity form could be an alternative to separate civilization arrangement of the world. Such transformation of human society into something similar to a single human body was identified more than half a century ago by English philosopher and mathematician Bertrand Russell who stated that in general human society assumed features of a uniform human body and if we were to exist further, we had to acquire feelings oriented towards increase of general wellbeing; the aspiration to individual wellbeing being focused on the whole organism, rather than on any separate part thereof (quoted from [10]).

In the current situation of multipole globalization, civilization measurement gathers particular importance. One of conditions of survival of any communities on the Earth is upholding of own interests of these communities. The self-preservation instinct places the world community before the necessity to develop a mechanism of accounting, acceptance and ensuring safety of coexistence of various models of socio-political and cultural society organization and specific vital interests².

Only in this case it will be possible to use fully rich, but various resources of all countries and nations as a potential of their own and global development of the humankind. And the new energy civilization will be based on reasonable combination of interests of all and everyone as well as natural, sociocultural, intellectual and technological potential, its expanded reproduction and efficient use in the course of life activity and global sustainable development of the multicomponent world.

This conclusion is also applicable and to the situation in Eurasia. Due to its natural and geographical features and historical ways of development it experiences a dynamic process of population shifts, spontaneously arising multiculturalism that countries has not managed yet to switch onto a certain

² For more details see, e.g., [11].

institutional, legislative track. Nevertheless, it is perhaps unlikely to slow down substantially and the more so to stop this process which objectively gains momentum. Therefore, both governments of certain countries, and governing bodies of interstate associations shall develop a coordinated task-oriented policy in this field in order to achieve the least confrontational, deep and steady integration of migrants into root structures of public life of countries and nations.

Relying on this theoretical basis, we shall consider as well the Eurasian civilization, including its east version, in relation to the subject of «energy civilization» we are concerned with here. Successful solution of all-civilization tasks will be also a key to progressive development of the Eurasian energy civilization as an integral and essential intrinsic element of the whole system.

2. EURASIAN ENERGY CIVILIZATION

According to L.N. Gumilyov's description which is not deprived of poetry, Eurasia is a many thousand-kilometer territory from Vistula and Dnieper in the West to the Pacific Ocean in the east, from the polar tundra to the foothills of Caucasus and Sayan Mountains, mainly far from sea coasts, in the zone of sharp continental climate. And on the wood-to-steppe, plain-to-mountains interfaces there was a powerful climatic gradient causing in local inhabitants impulsiveness and sharpness of vital manifestations and thoughts, strengthening the potential of an active (passionary) being and development [3].

As we can see, a considerable part of the continental space which is geographically understood as Eurasia (Fig. 1) is beyond the scope of this definition.

Historically the Eurasian continent was divided into two parts of the world: Europe and Asia (from Phoenician words «*eref*, *ereb*» meaning «West» and «*asu*» meaning «East»; these names were put into practice by ancient Greeks).



Fig. 1. Eurasia

It is natural that the border between Europe and Asia is quite conditional, and in scientific literature you may meet its various alternatives.

Eurasia is a cradle of many nations and civilizations, a place of origin and triumph of many great empires. The main ways of the Migration Period which predetermined most important milestones of the world history were routed across Eurasia. The effects of such movement of peoples (from Huns to Mongols) were distinguished by spontaneous assimilation with representatives of nations which were more developed in cultural terms rather than by oppression of conquered nationalities. Though, certainly, multi-thousand-year history of Eurasia witnessed quite a number of opposite examples.

A peculiar combination in the territory of Eurasia of natural and geographical and weather conditions predetermined the effect of production development of this territory. Eurasia is the largest continent on the globe and holds the predominant position in geopolitical terms. Eurasia accounts for more than one third of the land surface on the planet. More than 80 states of the world are situated here. About 75% of the world population live in Eurasia, and the most part of the world physical wealth also is in its territory, including mineral – in particular, fuel and energy – resources. A threat to global stability in the long term results from incomplete and therefore unpredictable shift of the center of global forces from the West to the East. For this reason Eurasia may be called the most important continent of the world. And, apparently, it will remain such in the foreseeable future.

However, as it was noted in one of analytical reports of the International Club «Valdai» [12], in the 21st century Eurasia is not a complete political and economic entity, it is «torn between» Europe and Asia, has no its own identity and is perceived from the outside as a stage of competition of great powers. As Zbignev Bzhezinsky once noted, Eurasia is a «chessboard» where a fight for world supremacy is going on, which fight affects geostrategy – strategic management of geopolitical interests [13].

And though this fight is currently headed not by a Eurasian state, Eurasia keeps its geopolitical value. Not only its western part – Europe – remains a place of concentration of considerable part of world political and economic power, but also its eastern part – Asia – became recently a vital center of economic development and growing political impact. And Russia stretches between these two parts – or, more accurately, partly in Europe, partly in Asia.

Without denying historical, philosophical and spacial content of the term «Eurasia» in L.N. Gumilyov's interpretation, we have to admit that today's strategic accents change its geographical parameters³. Our traditional understanding of Eurasia as a symbol of the Russian statehood and policy, mediator between Europe and Asia, including Central Asia and the Caucasus remained in the past. Drastic changes accompanying collapse of the USSR, as well as confrontation for energy resources and transport corridors outline new geopolitical borders of the concept «Eurasia», including therein the Balkans. A tendency to expansion of geopolitical influence of the European Union, which includes the Black Sea into the European zone, and NATO expansion, also justify inclusion of new strategic zones in the concept «Eurasia».

Russia holds key position on the map of Eurasia. The Russian ethnos is the backbone of the Russian statehood. It has formed and developed at the joint of various civilization influences: spiritual heritage of Byzantium which was an alloy of cultures of east Mediterranean and the Middle East, the Western Roman Empire and so-called «field» – culture of nomadic people with which the Russian population has neighbored for centuries.

Severe weather conditions and the extent of space played a significant role in forming of special civilization characteristics. The northern climate determined special importance of group behaviour as an important condition of survival, adaptability to the circumstances of life.

Natural peculiarities and special mentality of peoples of the eastern Eurasia generated by them created a historically special form, some kind of structural potential of their life activity: enclaves (centers) of production and sociocultural development and separate lines of their nomadic and trade interaction on huge open spaces of the «field».

In this context, the energy of development was based on active use of localized natural resources and sedentary/nomadic life which required strengthening of collectivist principles in the military and agricultural activity.

³ As K.V. Simonov, the CEO of the National Energy Security Fund noted, «In recent weeks I happened to attend two forums, the subject matter of which included the word «Eurasian». One of them, which is characteristic, was held in Seoul, and the other – in Verona. Eurasianism is understood very logically there, but nevertheless not quite typically for us. They speak about Eurasia as about common political and economic space spreading at least from Europe to Korea and Japan, and sometimes even including the United States. In Russia eurasianism is traditionally understood as something absolutely different, namely, a third way of Russia, which is neither Europe, nor Asia, but something special» [14].

Numerous Great Migrations of peoples (and not only in search of new fertile lands, but also due to their migratory mentality) expanded the habitat of peoples of Eurasia, but also left some «white spots» on its map. And this promoted expansion of Russia to the East, from the Urals to the Pacific Ocean, keeping cultural independence of local people and acquainting them with new technological and organizational capabilities of the new civilization.

At the same time the increasing impact of the civilization which developed in the Western Europe on the Eurasian society washed away the Russian specifics, «splitting» it into social elite and common people. Strengthening of these specifics of the Russian culture is observed today as well: conservatism and inertness of considerable part of the ruling elite; immaturity and consumer orientation of the Russian «business world» in combination with steady mistrust of a large part of population in authorities and everything that emanates from them [9, page 44-47].

At the same time if we consider Russia simultaneously from internal and external (say, European, American, Chinese, etc.) points of view, its community with them may be found in various combinations of interaction of civilizations.

Given all mentioned specific features of the civilization energy development of Russia based on an active use of natural resources and sociocultural potential it reasonably is a key player in the international energy markets that determines its important role in the formation and development of the Eurasian energy civilization.

Russia is the third in the world (after China and the USA) largest producer of energy resources and fourth largest consumer thereof (after China, the USA and the European Union) [15,16]. Russia accounts for 10% of world production and 5% of world consumption of energy resources and ranks first in terms of gas export, second in terms of oil export and third in terms of coal export, being the absolute leader in export of energy resources, covering 16% of world interregional energy trade. But Russia is not only the leading energy power on the Eurasian continent. Its role as a transport energy bridge between the East and the West is not less important. Occupying a huge part of the Eurasian continent and adjoining to the Southern Asia, Russia can become a strong logistic link between countries and regions saturated with energy resources⁴.

⁴ For more details see, e.g., [6]

The following objective factors condition traditionally leading place of the energy industry in the Russian economy:

- Russia is one of the coldest countries on the planet (two thirds of its territory are situated in the permafrost zone). As compared to the Central Europe the cold climate increases expenses for lighting and heating of buildings by 20% and makes construction and operation of housing and production facilities more expensive by 20-25%;
- extremely uneven placement of economy and population resulting in the biggest in the world length and amounts of freight and passenger traffic accompanied by respective energy costs.

Furthermore, Russia has a good natural base for the energy industry: 15% of all world explored reserves of fuel resources.

On the other hand, such a significant place of the energy industry in the Russian economy makes it greatly dependent on external conditions, in particular on world prices for energy resources. Without by no means belittling the importance of other countries referred to the East Eurasian civilization, it cannot be denied that Russia is to play one of leading roles in the formation of a new energy civilization in the territory of Eurasia.

In the end of this section, we would like to quote a very figurative assessment of the situation with development of integration projects and processes in Eurasia by Antonio Fallico, the President of «Conoscere Eurasia» Association, the Chairman of the Board of Directors of Banca Intesa, who speaking at the St. Petersburg International Economic Forum - SPIEF-2016, told: «I will begin with a children's riddle which is used in my country. Why a crane stands on one foot? Because if it lifts the other, it will fall. In the Big Eurasia interstate associations, groups of countries stand on one foot. This does not add them stability though they do not fall so far. European Union considers itself mainly in a transatlantic dimension. It watches suspiciously what happens to the east, and now with fear – what happens to the south, in the Middle East. Russia as a center of gravity of a huge part of Eurasia, reasonably speaks about itself as about an inseparable part of Europe. Sometimes, under the pressure of circumstances, it remembers also its Asian dimension – as if the eagle from its coat of arms recalls that it has the second head. China, a sovereign state, continues to represent itself the center of the world and through this prism considers surrounding territories as directions for expansion of Chinese capital, companies and manpower. Let's not forget about SCO, ASEAN, countries of the Southern

Asia. Figuratively speaking, key players of Big Eurasia stand on one foot. If they remain isolated in themselves, they will retract the second foot and will fall, as in the Italian children's riddle. It means that they have to get on both feet. But this is in theory. In practice everything is much more difficult. At construction of Big Eurasia the balance of interests as it seems to me, has to become key concept. Integration processes have to proceed along all directions.» [17].

But these integration processes should not wash away specific features of development of individual countries based on their own potential and its use both inside their region and on the world scene. At the same time it is not possible to keep the status quo: division of the world into resource-exporting countries and countries experiencing energy shortage. Former resource-based globalization of the world gives way to its regionalization. And this raises the question of energy security of all and everyone in a new way. At the same time the technology base of the energy civilization, and in the nearest future, intellectual systems making it possible to both use natural resources more efficiently, and to create new human-machine (ergatic) systems, have been becoming the main potential of the development.

That said, transition to a new energy civilization with possibility to use overall energy potential of development similar to the concept of national wealth (public benefit), is based on a deep analysis of transformation of the world energy industry and its dominating factor – natural energy resources.

3. CURRENT PROCESSES OF DEVELOPMENT OF THE WORLD ENERGY INDUSTRY

3.1. New energy picture of the world

During the last 5 to 7 years a new energy picture of the world formed. It is determined by the following factors [18]:

- the USA have transformed from hydrocarbons consumption leader into their largest producer and, in the long term, they may become their significant exporter;
- China has become a largest oil consumer;
- basic changes in the energy sphere occurred due to the implementation of new technological solutions, radical technology improvement in all directions, including:
 - new oil and gas exploration and production technologies (including heavy and ultra-heavy oil; oil of low-permeability collectors and dense rocks in the USA, which brought about the «shale revolution»; Canada oil sands);
 - cost reduction in production of renewable energy sources (RES) and environmental protection concerns. As a result the need for fossil fuel decreases;
 - increase in production of liquefied natural gas (LNG) and its transportation volumes. Thereby, the natural gas market becomes mobile and interregional;
 - improvement of energy saving technologies which disproves forecasts of continuous increase in energy consumption;
 - the trend of increased production of electric vehicles (in the USA, Europe, China) leading to the reduction of share of vehicles burning gasoline and diesel fuel;
 - Japan's intention to begin in 2019 full-scale industrial development of gas hydrates, etc.

In geopolitical terms the mentioned changes of the energy picture of the world give rise to complication of relations between the USA and China, the USA and Saudi Arabia (as well as between Saudi Arabia and other countries of the Middle East); between the USA and Russia, the USA and Europe. In this way a new architecture of the world economy and a new map of the world energy space is being formed.

Under these conditions the need of industrially developed countries (first of all countries of the Atlantic civilization) in supply of energy resources from regions of the Middle East, North Africa, Central Asia and Russia traditionally rich with excess energy will decrease due to objective reasons. On the other hand, these regions historically developed through the export of raw materials, and lack of demand for these resources will not only aggravate economic contradictions between the regions, but will also escalate intercivilization tension.

These relations concern, first of all, historical mentality of the main types of civilization. The Atlantic world have been developing mainly due to liberalization and market relations, especially in the field of international trade, receiving resources in exchange for the processing industry products. Meanwhile the rich have been becoming richer, and poor – poorer.

But not only production of material valuables divided civilizations. Historically, in countries of Islamic and Eurasian civilizations another type of public relations formed – with orientation to a paternalism of the state because territorial and demographic factors required centralization of power. And this call for a dominating development of state ideology or religious autarchy⁵. Panhuman «values» that the Western world considered and considers to be universal for all, caused natural rejection in these countries and did not promote harmonious and balanced type of relationship. In the energy industry this prompted, in particular, block opposition of OPEC countries and association of OECD countries – IEA members.

Considerable intercivilization distinctions exist also in organization of the main energy structures (institutions). In the Atlantic civilization countries the mainstay of the energy sector is formed by public (joint-stock) companies whereas in «antipode» countries such as Saudi Arabia and China, Russia and countries of the Central Asia, national state companies continue to dominate, successfully resisting transnational oil and gas giants.

Of course, under the world market conditions where today the leading role is played by consumers rather than producers, block opposition is not a successful form of international cooperation.

New forms of relationship are required, which would make it possible to meet interests of all parties, to keep their mentality and other factors of the general energy potential. At the same time it is necessary to provide for

⁵ The told belongs to the characteristic of civilization types in general, and at all does not deny that in the certain countries (and, especially, social national groups) can have (and have!) place and opposite lines and phenomena.

the concentration of world intellectual and financial resources on solution of pressing problems of the humankind – supplying all inhabitants of the planet with sufficient and economically acceptable energy and meeting UN requirements for sustainable development and ecological efficiency of the energy industry.

It is natural that all these changes also fully affected Russia claiming (fairly or not – it is another question) the role and status of a great energy power (energy superstate). Historical and economic particularities of development of our country, incompleteness of economic reforms and economy model based on export of raw materials which has become traditional for the country, given backwardness of modern political and civil institutions make dependence of the Russian energy industry on geopolitics especially painful.

Numerous researches of Russian and foreign experts confirm more and more our hypotheses (and then – ours conclusions), advanced as early as the beginning of this decade that currently the world is on the threshold of global energy changes, and that deep qualitative shifts started and continue in the development of the world energy sector.

If we add fast development of communication technologies, wide availability of new mechanisms of social and political mobilization, sharp increase in migratory processes and some other modern challenges, one may easily conclude that quite hard times await the humankind [19].

Besides, recent events once again demonstrated that under conditions of globalization and rapid development of new technologies geopolitical factors has not lose their influence on development of the energy industry. Moreover, to some extent they even became determinant. Under their influence a new architecture of the world economy and international relations is being formed, a return to the policy of balance of forces and power politics has begun. And under such conditions it will be more and more difficult for the energy industry to perform its main task – to ensure uninterrupted, reliable and efficient supply of consumers with fuel and energy.

Under new geopolitical realities «big-league politics» began determining the vector of energy cooperation, or rather – energy relationship – of Russia virtually in all directions, especially in the West (with the European Union and the USA) and in the east (with China, Japan and other countries of the North-East Asia)⁶.

At the same time the energy industry is even more often used as a political tool.

⁶ For more details see [20].

Mutually beneficial energy cooperation remains the main and nearly the only solution of economic development and energy security issues both of individual countries, and of the whole world. We stressed more than once that distinctions between countries, cultures, visions always existed and still remain. But the task is not to «play the card», bringing the situation to the point of absurdity. The task, figuratively speaking, is, while accepting as objective reality distinctions in tastes and capabilities of owners, to arrange at one's own discretion own rooms in the world and «all-European» house, to achieve development and wellbeing of the whole house and the adjoining territory [19,21].

However currently the leaders of the USA and their allies triggered opposite processes. Thereby new most serious challenges have been added for the humankind which supplement already very difficult set of challenges the modern energy faces.

Speaking about the energy situation in the world, we would like to dwell not on its specific changes which happen almost continuously, but only on those of them that have a long-term effect and essentially change our ideas of the energy industry of the decades to come.

This is, first of all, the problem of shortage of energy. It was formulated (and proved, based on the then level of knowledge) as early as in the middle of the last century by so-called Club of Rome, and since then the humankind has been living under the «Damocles' sword» of limited supply of energy, eventual energy shortage for its development. The threat of this shortage determined not only general economic and energy policy of leading countries, but also practical measures of governments and businesses.

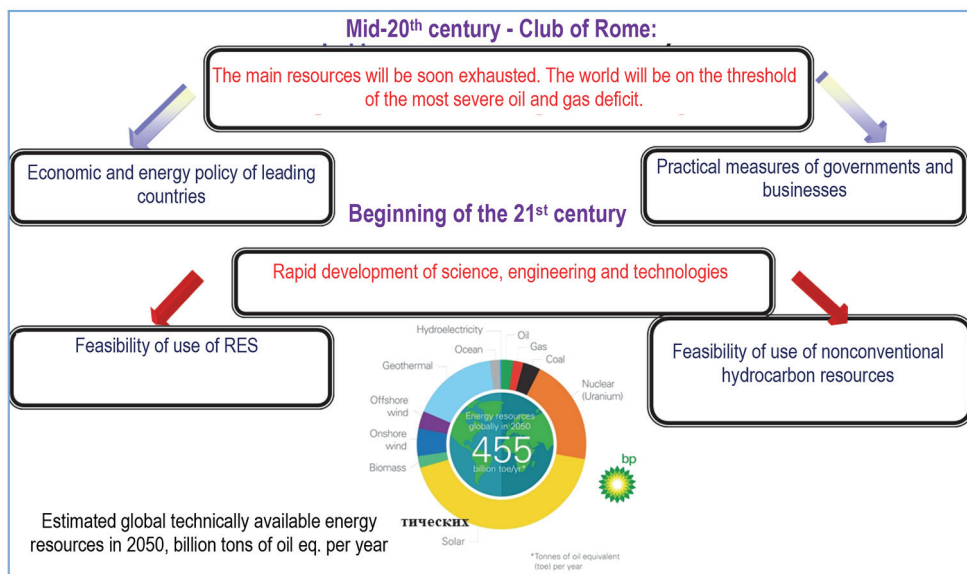
At the beginning of this century the situation started changing. The development of science, engineering and technologies opened to the humankind not only possibility of commercially efficient use on a large scale of renewable energy sources (such as solar, geothermal, wind, tidal energy, etc.), but also almost unlimited amounts of nonconventional hydrocarbon resources (Fig. 2).

The same progress, having shown that energy hunger does not threaten the planet, resulted not only in decrease in energy shortage threats, but also to the need to rethink the problems and outlooks of the world energy balance in general. In our opinion, first of all technological factor is a determinant factor of future changes of the world energy balance and its structure, namely: the degree of availability and efficiency of technologies

providing for the development of nonconventional oil and gas resources, the use of renewable energy sources, increasing energy usage efficiency, forming an innovation economy based on low-energy, nano-, bio-, information, cognitive and other similar technologies.

Respectively, the thesis about the threat of energy shortage is advanced more and more seldom. In recent years it is recalled either by inertia, or for purely tactical, speculative purposes to further specific solutions, projects or technologies [23].

Meanwhile, scientific and technological achievements give ground to claim with high probability that the era of global surplus of energy resources approaches. Therefore it is possible to predict a change in the energy philosophy – philosophy of threat of shortage of energy that hanged over the humankind for more than half a century since the Club of Rome. Times when availability of natural resources allowed their owners to dictate their terms to consumers are over – if not beyond retrieve, at least for a long time. And the decision-makers empowered to take decisions affecting the interests and destinies of millions of people should not only understand it, but also act proceeding from this understanding.



Source: [22]

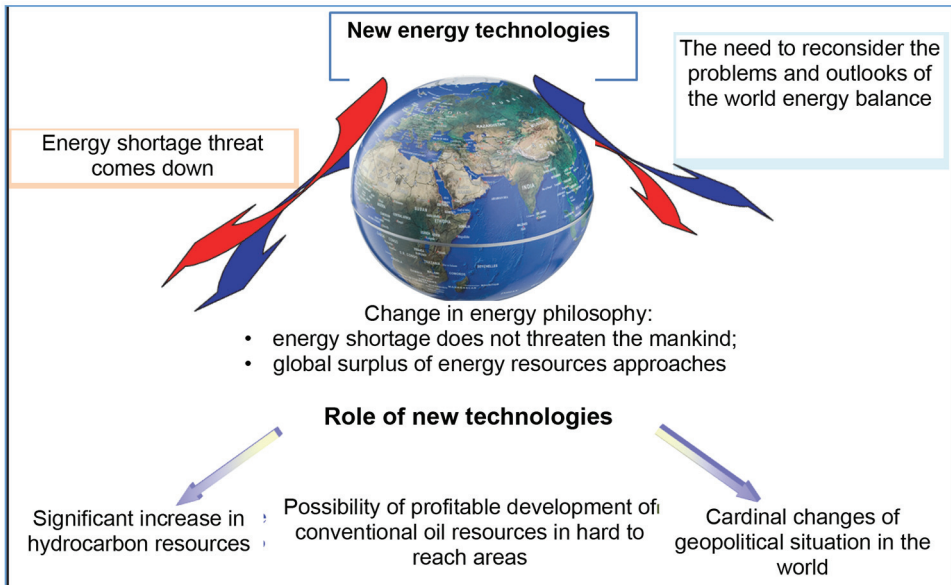
Fig. 2. Evolution of the world energy situation

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Besides, possibility of an efficient use of RES and nonconventional hydrocarbons not only increases total resources of energy carriers, but also cardinally changes the geopolitical situation in the world. In particular, it can influence further development of the world energy markets and essentially change «alignment of forces» and division of states into exporting and importing countries. Overall influence of the technology factor on geopolitical processes in the energy sphere is shown in Fig. 3.

Speaking about current processes in the development of the world energy industry, it should be also noted that they take place against the background of a number of contradictory trends. These include the dominant of natural resources, the production process of their transformation into the end consumer product; orientation to the expansion in consumption of material benefits, on the one hand, and ensuring ecological safety and more complete usage of human potential, from the other, etc.

Objective resource globalization process generates an aspiration to regional resource security, or self-sufficiency, the use of new technologies for the development of own nonconventional resources. This geopolitical task was stated in general in 1973 by the U.S. President Richard Nixon



Source: [22]

Fig. 3. New technologies – new outlooks

and incorporated into some legal acts of the USA adopted in response to an energy crisis of 1973-1974 (Arab Oil Embargo of 1973; Emergency Petroleum Allocation Act of 1973; Energy Policy and Conservation Act of 1975; Energy Conservation and Production Act, 1976; National Energy Conservation and Policy Act, PL 100-12; Comprehensive National Energy Strategy, 1998, etc.) [24].

Energy independence of the USA since the energy crisis of 1973-1974 is one of key political tasks of any American president. Each presidential aspirant deems it necessary to include the issue of its strengthening into his/her election programme⁷. To a certain degree similar processes happen also in the European Union where we witness a shift from the energy dialogue between Russia and the European Union towards reduction of dependence of European countries experiencing energy shortage upon supply of energy resources, first of all gas, from Russia.

When identifying opportunities and priorities of the energy policy, one shall take into consideration such indicators of the potential of developed countries and regions as infrastructure security, spiritual and cultural factors, intellectual role of human capital, social organization and mentality of society. It should be noted, however, that, despite explicit influence of these factors, it is difficult to quantify them [9].

World energy markets are the most important component of the global energy sector. The expert community estimates changes therein in the next 20 – 25 years as positive in general. At the same time they can create serious risks not only for the fuel and energy complex of Russia, but also for the Russian economy as a whole.

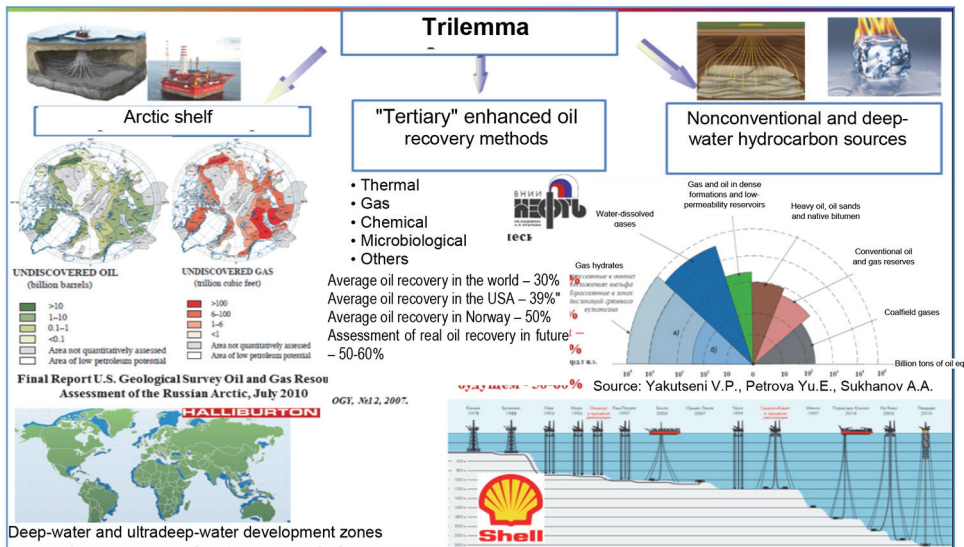
As it is expected, the development of these markets – for the period till 2040 and further – will be characterized by the deepening of their transformation, increase in the demand share of developing countries, aggravation of competition. The competition will be both direct, for example, in the market of liquefied natural gas (LNG), and indirect (interfuel), in particular in the market of conventional and renewable energy sources (RES). Uncertainties and risks in the long-term development of the world markets will increase, in particular, as a result of influence of the technological progress on prices of energy resources, including oil. At the same time, striving for ensuring long-term stability and predictability in the energy markets, as well as for global energy security intensifies.

⁷ For more details see [25].

So, in the next years and decades we may expect further hardening of competition for a share in the energy balance of hydrocarbons extracted on Arctic seas shelf, those produced as a result of increase in oil and gas recovery of producing fields and development of deep-water and nonconventional sources of oil and gas (Fig. 4).

Each of above lines of activity has a considerable resource base, respective advantages and drawbacks related to the conditions of production and product delivery to the markets. Therefore priorities in their development will be first of all determined by the latest technical and technological solutions making it possible to ensure cost-effective hydrocarbon production at acceptable environmental risks and results. The said technical and technological solutions will also determine an optimum place of each of these oil and gas production lines of activity in the world energy balance, and an optimum ratio between them at each given time period.

The line of activity that provides for a quicker reduction of production costs will be among the main priorities of world oil production.



Source: [22]

Fig. 4. Different sources, but same consumers

3.2. Hydrocarbons as a basis resource for world energy consumption

Almost all of the above-mentioned problems have a system nature and are interdependent. They combine geopolitical, economic, resource, ecological, technological and social factors. The world community responds to new challenges by a qualitative development and quantitative expansion of international energy cooperation. Adequate answers to new challenges may include, in particular, concentration of world intellectual and financial resources; development of new technologies for production, generation, transportation and use of energy resources; awareness of the need of respect for the environment; cardinal changes in the world financial sphere.

In the coming 25 to 30 years a new technological revolution in the energy industry is hardly probable (for example, mastering cheap thermonuclear synthesis or gravitation), but large technology breaks are expected. They already have an effect in the development of nonconventional oil and gas resources, opening up of new types of motor fuel – biofuel, compressed and liquefied methane on transport, synthetic motor fuel obtained from gas and coal, and others.

Such an expansion of the resource base of the energy industry may postpone for decades the peaks of oil and gas production, and – along with the use of oil substitutes – slow down increase and reduce volatility of hydrocarbon prices. The prospects of development of huge resources of gas hydrates also began coming into view [26].

But if production of shale oil or gas, as well as a wide-spread occurrence of electric vehicles can have a strong impact on the world energy balance and international energy resources trade flows within the 30-year period under consideration, the situation with other promising energy carriers is more complicated. Wide use of liquid biofuel and biogas, beginning of production of gas hydrates face a number of various restrictions and obstacles. Therefore these energy carriers will hardly be able to significantly change the world energy balance within this time frame [27].

However even given all already obvious and expected benefits of the «new» energy industry, during the next 30-50 years hydrocarbons will continue to dominate with some decrease in the share of oil and essential increase in demand for gas fuel, especially on the part of heat and power industry.

At high oil prices (exceeding \$70/bbl), which were registered eventually for the entire period from April, 2006 to November, 2014, excepting

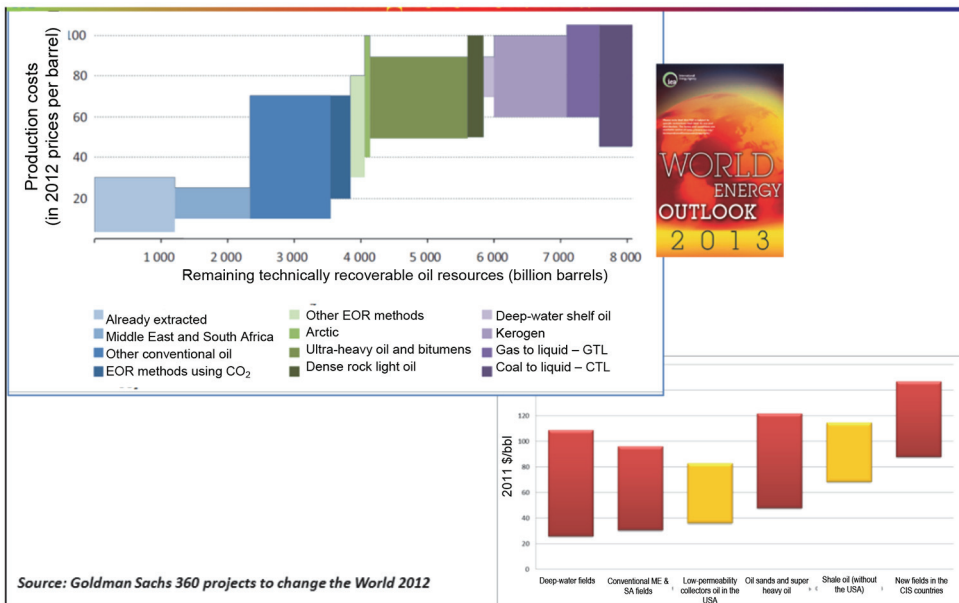
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September, 2006 to May, 2007 and October, 2008 to June (September), 2009, expensive oil resources – deep-water fields, low-permeability collectors and dense rocks in the USA, Canada oil sands, Venezuela ultra-heavy oil, and others – began to be actively involved in the world balance of liquid fuel. Also, extensive exploration works were carried out in the Arctic shelf.

The assessment of production cost of these and other potential resources of liquid fuel made in 2013 by the experts of the International Energy Agency and Goldman Sachs Bank is shown in Fig. 5.

The ranking of priorities of world production of liquid fuel under conditions of high oil prices and fast-growing demand was in general as follows:

- conventional oil of the Middle East and North Africa;
- conventional oil of other areas, except for deep-water and Arctic shelf fields;
- methods for increasing oil recovery factor of reservoirs of conventional oil in producing areas;
- light oil of dense (low-permeability) rocks, i.e. shale oil of the USA;
- oil sands, ultra-heavy oil and bitumens;
- deep-water and Arctic shelf oil.



Source: [22]

Fig. 5. Production (supply) costs of various types of liquid fuel

Followed various technologies of production of so-called synthetic oil – gas-to-liquids fuel from natural gas and coal, production costs of which were even higher.

In particular, costs of oil extraction in the Arctic were at that time estimated within rather a broad range from \$40 to \$100 for 1 barrel in 2012 prices.

Similar values were given also by the Russian experts. So, according to the estimates of the Ministry of Energy of the Russian Federation, announced at the St. Petersburg International Economic Forum in 2015, the cost of oil extraction in the Arctic shelf was \$30 to \$100/bbl

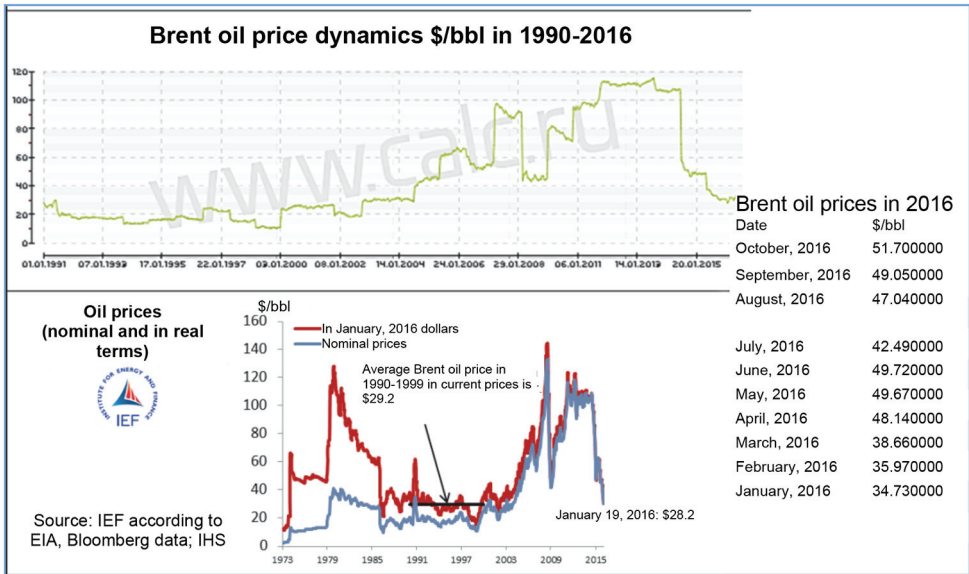
It should be borne in mind that the lower values of these ranges apply either to the Arctic land, or to the non-freezing shelf of the western part of the Arctic – the Norwegian and Barents seas. This conclusion was fully confirmed by the President and CEO of Lapland Chamber of Commerce, Mr. Timo Rautajoki at the conference «International Cooperation in the Arctic: New Challenges and Vectors of Development», carried out on October 12-13, 2016 in Moscow by the Russian International Affairs Council: «At oil prices of \$50 per barrel an efficient development of the Norwegian offshore resources is possible only with the use of new technologies».

For the remaining part of the shelf estimates in the upper part of the range – from \$70 to \$100 per barrel are more characteristic.

Respective forecasts of IEA, the Ministry of Energy of the USA, BP, and other recognized analytical centres predict significant growth in production of expensive hydrocarbons: natural bitumens, heavy, high-viscosity and shale oil, shale gas and methane of coal beds, oil and gas deposited at big depths and in low-permeability rocks.

However in recent years the situation changed drastically. Slowdown of the world economic growth in 2014 caused weakening of oil demand, and in September, 2014 oil prices started declining, and then took a nosedive when at the end of November OPEC under the pressure of Saudi Arabia resolved not to reduce production quota. Already by the first decade of December, 2014 oil prices fell by 40% – from \$115/bbl to \$65/bbl, and then to \$53/bbl. This marked the beginning of the price war in order to retain the market share for a long-term and to transfer the balancing load to competitors with high costs.

Falling of prices, with some breaks, continued till January 20, 2016 when the cost of Brent oil fell to \$28.22/bbl. But by January 29 it grew up to \$35.87/bbl again. And then a new price drop, and a new growth which, with fluctuations, has continued until recently (Fig. 6).



Source: [22]

Fig. 6. Variation of Brent crude oil prices

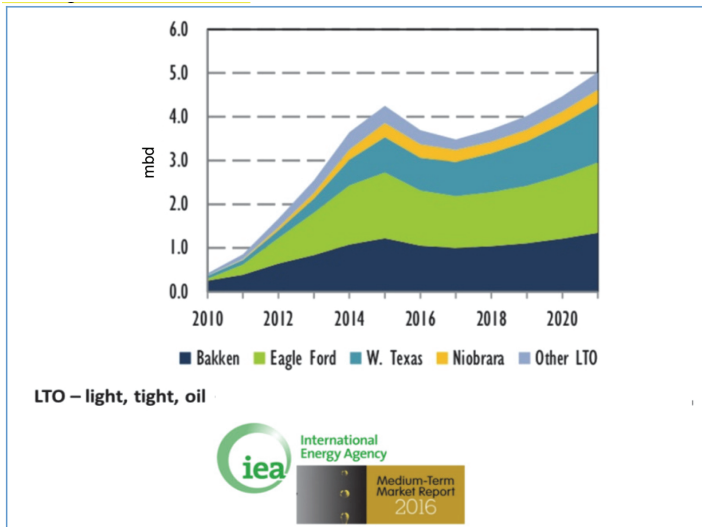
In general by the autumn of 2016 moderate oil prices (about \$50/bbl) substituted for low prices (\$30-40/bbl).

According to the IEA estimates made in 2016, the situation with oil prices and balance of demand for it and world production would not significantly change in the nearest future though fast production cutback rates have been more and more obvious in the USA [28].

However in some years the situation in the USA will change again, and total production of liquid fuel by 2021 will increase here by 1.3 mb/d as compared to 2015.

The main production growth in the USA will be provided by shale oil (light oil of dense low-permeability rocks) – Fig. 7 production of which in 2016-2017 will be reduced by 800 thousand bbl/day due to low prices.

The main objective of OPEC refusal to decrease oil extraction in 2014-2015 was to shake out from the market oils producers incurring high production costs, first of all the USA with their shale oil. At the beginning of the 2010s it was believed that profitability of oil extraction from shale rocks in the USA may be ensured only at rather high oil prices. So, by IEA estimates made in the middle of 2014, the breakeven point for shale projects in the USA was \$80/bbl [29].



Source: [28]

Fig. 7. Forecast of shale oil production in the USA

However shale producers oil in the USA achieved lately a growth of drilling efficiency and considerable expense reduction, cut the cost of used processes and hedged financial risks, thereby accumulating a large durability and flexibility margin (Fig. 8)⁸.

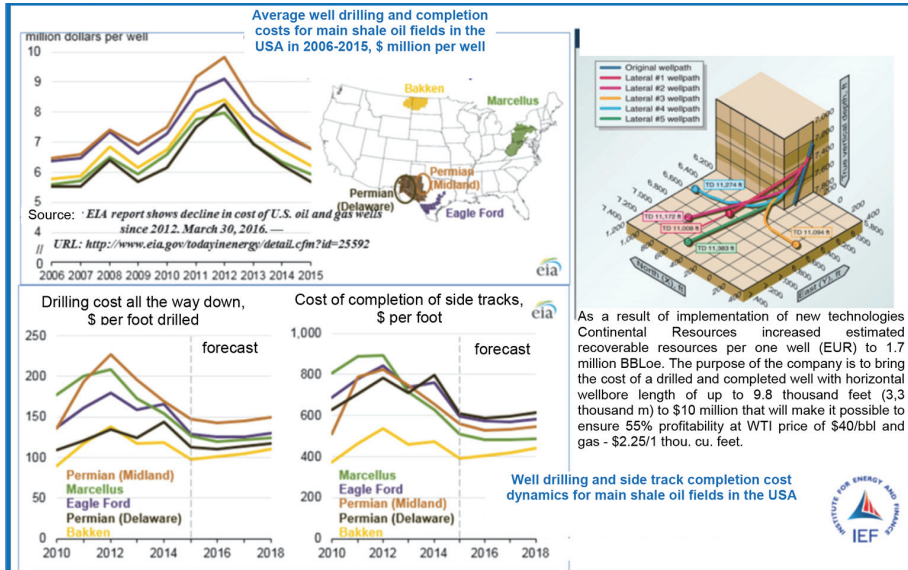
In particular, American oil and gas companies' exploration and production costs in 2015 decreased by 25–30% as compared to the ten-year maximum of 2012.

The cost of construction of one well in the largest USA shale oil fields (Eagle Ford, Bakken, Marcellus and Permian) decreased by 7–22% as against 2014 [31].

By the estimates of experts of Citigroup, ITG, Bank of America and some other analytical and financial structures, production of shale oil remains profitable at the oil price of at least \$60-65/bbl [32]. Therefore, at current price level (\$45-47/bbl) new wells are unprofitable (Fig. 9).

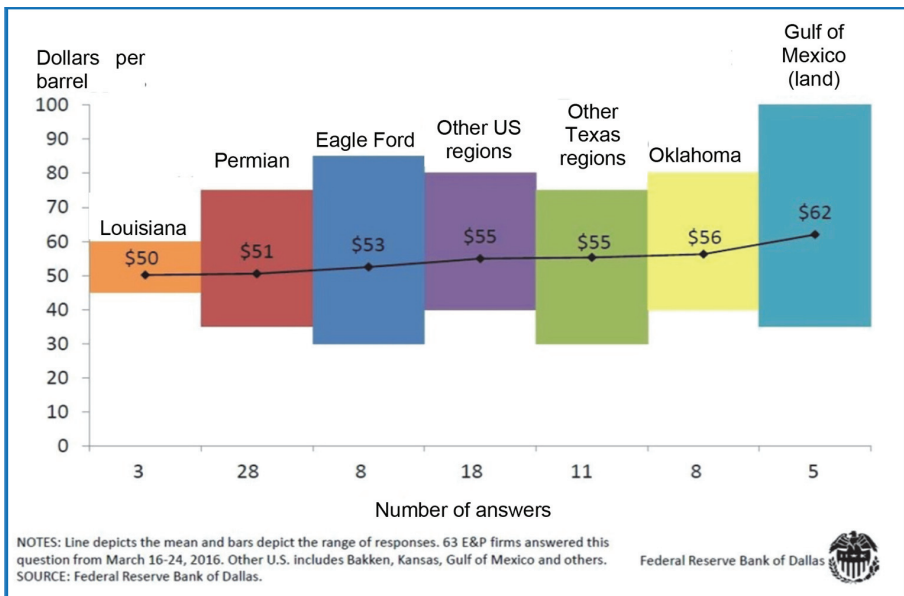
⁸ It should be noted that for the last two to three years many other oil and gas companies also achieved essential cost reduction of oil and gas extraction. Wood Mackenzie experts predict further cost reduction in the upstream sector (exploration, production) in 2017 by 5 to 7%. In this context specific investments per 1 barrel of oil equivalent will decrease this year to \$7 against \$17 in 2014. The IRR will grow from 9% to 16%. It will make it possible to almost double the number of investment solutions taken as compared to 2016 [30].

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Source: [22]

Fig. 8. Variation of shale oil production cost in the USA



Source: [34]

Fig. 9. Assessment of profitability level for new wells in various USA regions (based on results of the survey of analysts and oil and gas companies' top managers)

However taking into account that the main amounts of shale oil are supplied from developed sites where costs are much lower, shale sector, according to the American analyst analytical company RBN Energy, can continue to stay afloat at prices of at least \$40/bbl. Similar situation is with oil-bearing sandstones of Canada [33].

First of all from low oil prices suffered deep-water fields and Arctic shelf development projects.

The reasons thereof are quite clear. We would like to note only that the reaction of oil producers to falling oil prices was predictable. It included abandoning of new expensive projects, and improvement of technologies in order to cut down production costs. In particular, in the upstream, these are first of all projects of development of deep-water and Arctic resources of conventional hydrocarbons, and oil-bearing sandstones. So, by the estimates of the Norwegian consulting company Rystad Energy published in January, 2016 since the beginning of the oil crisis 63 oil and gas projects worldwide with total cost of more than \$230 bln were cancelled or postponed.

Close figures are given also by the analysts of British consulting company Wood Mackenzie who predict a decrease in investments into oil and gas sector during the period from 2014 to 2016 by 40% worldwide⁹. But already in 2017, according to the last report of Wood Mackenzie, investments into world upstream sector at current oil prices may – for the first time in two years – grow by 3%, to \$450 bln [30].

In 2016, according to Morgan Stanley investment bank which analysed investment forecast statements of 121 energy companies, they were going to reduce investments by another 25%. Similar estimates were made in 2016 also by IEA analysts (Fig. 10).

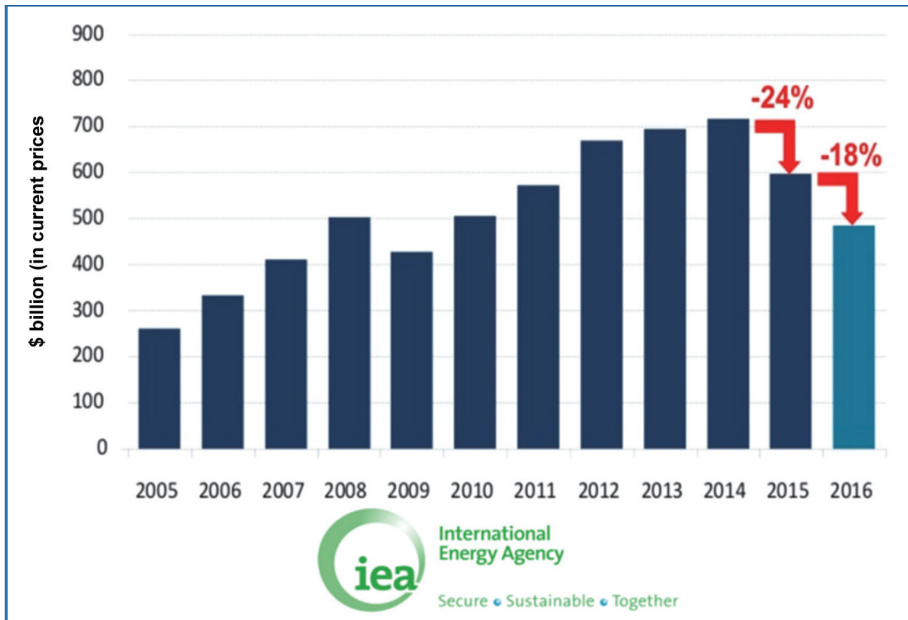
A detailed analysis of investment behaviour in the oil and gas sector of the world economy (by countries and regions) was made as well by the IMF (Fig. 11).

Goldman Sachs analysts, having assessed 61 new projects, stated that if oil prices remain at a low level, by 2020 investments may be reduced more than twice.

In particular, works on the Arctic shelf have been eventually suspended (except for projects on the shallow-water shelf of the Norwegian and Barents seas and those Arctic projects which were launched in the period of high prices).

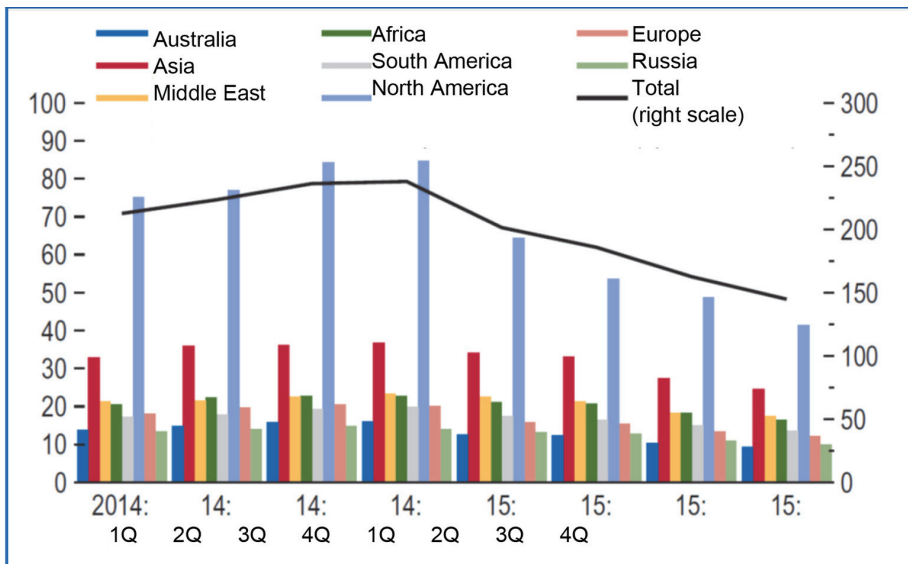
⁹ In January, 2017 Wood Mackenzie confirmed that the volume of investments of exploration and production (E&P) companies worldwide remains by 40% lower than the level reached in 2014 [30].

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Source: [28]

Fig. 10. Investments into production oil and gas projects



Source: [35]

Fig. 11. Quarterly capital expenses in the oil and gas sector of the main producing countries (\$ bln)

Russian companies in 2015-2016 also curtailed their investments (in dollar equivalent).

According to Rystad Energy estimates published in October, 2015, the highest production costs are characteristic of oil-bearing sands and Arctic hydrocarbons, profitable development of which is possible only at world oil prices of about \$80/bbl (Fig. 12).

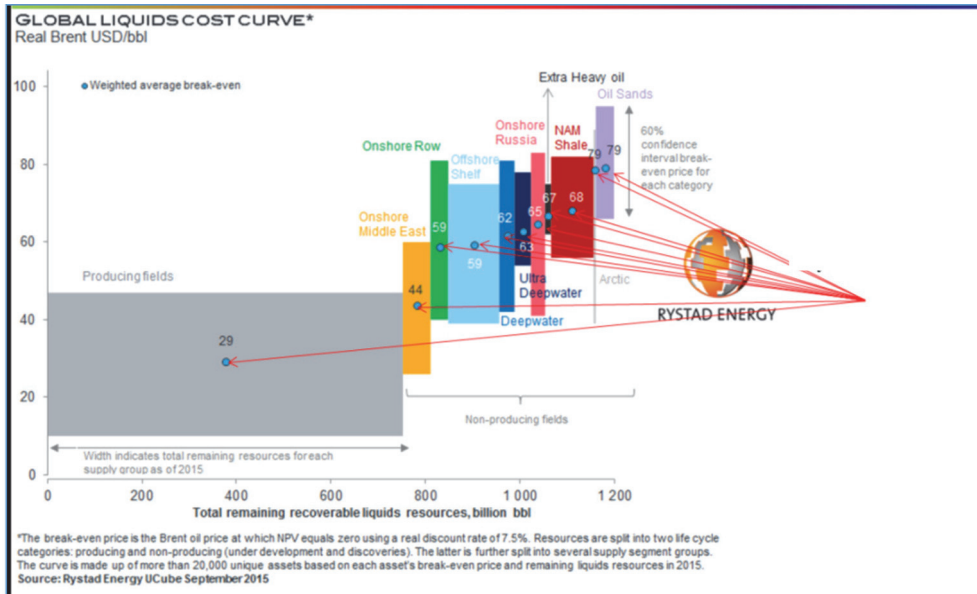
Next follow low-permeability rocks, ultra-heavy oil and deep-water shelf oil extraction projects which, to be profitable, need world oil prices of at least \$62-68/bbl.

As to the Arctic shelf, in September, 2015 Shell declared cancellation of exploration and drilling operations on the shelf of Alaska and curtailment of its Arctic program worth \$7 billion. Suspension of works on the Arctic shelf of North America was also announced in 2015 by other largest companies ExxonMobil, Chevron and BP. The Italian Eni once again postponed the date of commissioning of the oil platform in the Norwegian field of Goliat in the Barents Sea. The Norwegian Statoil declared on October 28, 2015 that postponed the launching date of the largest Mariner field development project, investments in which exceed \$7 bln, and in November announced abandonment of operations at 16 sites in the Chukchi Sea. The administration of U.S. President declared cancellation of state biddings for the right to perform drilling operations in the Chukchi Sea and the Beaufort Sea which were scheduled for 2016 and 2017. In January, 2015 Statoil, Dong Energy (Denmark) and GDF Suez (France) surrendered most of their prospecting licenses for the Arctic shelf of Greenland (Baffin Bay).

His assessment of the situation was given also by A.V. Dyukov, the Chairman of the Board and the CEO of PAO Gazpromneft, who speaking on SPIEF-2016 stated: «When it comes to other shelf projects which are at the initial stage of exploration works, under current conditions these projects do not pay off» [37].

And, at last, termless prohibition for new drilling and oil and gas extraction on the Arctic shelf of the USA was imposed by Barack Obama one month before the expiration of his presidential powers. Simultaneously, the same ban was imposed by Canada [38].

The prohibition applies to the prospecting activity over the area of 46.5 million hectares (115 million acres) in federal waters of Alaska in the Chukchi Sea and the most part of the Beaufort Sea, as well as 1.5 million hectares (3.8 million acres) in the Atlantic Ocean from New England to the Chesapeake Bay [39].



Source: [36]

Fig. 12. Production cost estimation for oil from various sources in 2015, \$/bbl

The prohibition contradicts the plans of the elected U.S. President Donald Trump declared during election campaign regarding expansion of offshore exploration and production of hydrocarbons. B. Obama managed to bring the shelf out of the zone of eventual oil and gas production by means of a 60-year old law which allows for such withdrawals of territories to protect local ecosystems. And notably, the law does not provide for a mechanism to cancel the decision. According to experts, the only option which can be hypothetically used is the cancellation of the decision by court, but lawyers do not dare estimating the outlooks of such claim, not to mention political effects of opposition in court of policy of two presidents [40].

Most likely, in the next months the destiny of this prohibition will become more clear¹⁰.

¹⁰ It can be noted that some experts think that this prohibition will not have a substantial practical value for oil production in the USA. The resource base of the industry greatly increased as a result of shale revolution and as compared to offshore, shale projects are much more convenient even if oil prices or demand model change dramatically. This assumption is also supported by the last forecast (AEO2017) issued on January 5, 2017 by the U.S. Energy Information Administration, EIA, where there is no one word about the Arctic shelf [41].

The only exceptions from the above-mentioned projects are projects on the shallow-water shelf of the Norwegian and Barents seas. They include started production on Goliath field and an exploration drilling program by Statoil, since despite significant risks of drilling in the Arctic, it is vital for the company to confirm availability of oil and gas resources in this area. Besides, Arctic projects which were launched during the period of high prices will continue operations also.

In this way, under conditions of low prices for energy resources, Arctic shelf development plans were frozen and almost completely drops out of priorities of development of the world oil and gas industry. According to the figurative expression of the founder of Swiss Polar Institute, a honourable polar explorer of Russia Frederik Paulsen, «oil and gas projects of the Arctic shelf have been put on cold Arctic ice, but with an increase in oil prices oil fever in this area will resume with a new force».

It should be also noted that falling of oil prices did not resulted in a growth of its consumption though many experts, including those from the IMF, thought that reduction of oil prices stimulates not only the demand for it, but also the whole world economic growth [42].

Besides the fundamental factor – decrease in demand and, therefore, energy prices – against the background of stagnation of the world economy the dynamics of world oil prices depend heavily on financial market condition [84] which is characterised by a high and periodically changing volatility. Thus, regular forecasts of oil prices published on the website of the Institute of Energy Strategy (IES, Moscow – <http://energystrategy.ru>) predict falling of prices in 2014-2016, their new growth in 2016-2018, and subsequent next drop in 2019-2020 [11]. In this context, 2 to 3 year and 10 to 12 year cycles, and longer trends of price dynamics may be identified.

Of course, prices are also determined by geopolitical factor. So, agreements on freezing and eventual reduction of oil production and export reached by Russia and OPEC countries already resulted in stabilization of the world oil demand-supply situation. At the same time controversial decisions of the new American president D. Trump regarding lifting of the ban for the construction of the oil pipe from Alaska may result in reduction of WTI prices and worsen conditions of production of shale oil in the USA that will affect in its turn general world price environment.

Implementation of the Paris Agreement reached on December 12, 2015 will also have an impact on the duration of the period of low prices.

According to the estimates of experts, the implementation of this agreement will directly affect the role of oil and gas in the future energy balance of the world. So, Kepler Cheuvreux investment consulting firm calculated that if the policy of restriction of global warming to 2°C will be jointly pursued at the international level, in the two next decades the world raw industry will be short of \$28 trillion of revenue, and the most part of which, \$19,4 trillion, will be lost by the oil industry [42a]. Of course, the probability of such a drastic turn on a global scale is not too high today, but it is not at all zero.

The last OPEC review issued at the beginning of November, 2016 shows that taking into account the analysis of climatic policy after COP21 in Paris considerable reduction in both general demand for energy resources, and for oil, and even natural gas is quite possible [43].

In particular, the Paris Agreement provides that member countries¹¹ will developed and present by 2020 the strategy of long-term development until the middle of the century with a low level of greenhouse gas emissions.

However, the time required for initiation and implementation of oil and gas projects is much longer than possible duration of the period of low oil prices (Fig. 13). It significantly raises both risks, and uncertainties incidental to new oil and gas projects on the Arctic shelf.

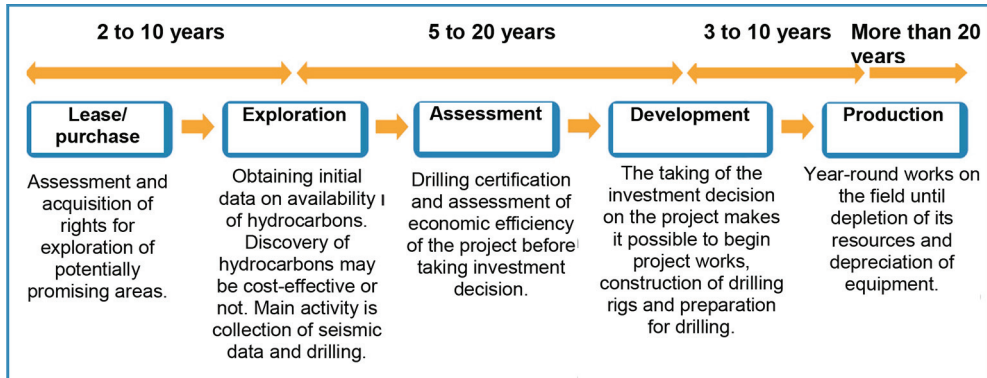
But even being optimists, experts of Citigroup analytical service who believe that oil prices will be about \$60/bbl in 2017 and \$64/bbl in 2018, recognize that such price level does not cover complete cycle costs of many projects necessary for the industry and therefore investments into them carry significant risks [37].

And, nevertheless, estimates and forecasts of leading analytical centers published in the recent years confirm earlier conclusions that in the next decades (at least, till 2035-2040) hydrocarbons will remain a basis of world energy consumption.

So, according to the IEA forecasts made already taking into account falling of oil prices and decline of investments into the oil and gas industry [46,47], oil consumption in the world in 2014-2040 in the *New Policies Scenario* will grow by 12 mb/d and will reach 103.5 mb/d (about 4,783 million tons of oil equivalent). Natural gas consumption will amount to

¹¹ Paris Agreement was adopted by all 196 signatories of the United Nations Framework Convention on Climate Change (UNFCCC) at the 21st Conference of the Parties of the UNFCCC held in Paris on December 12, 2015. By the mid-January, 2017 194 of them signed, and 125 ratified the Agreement [45].

5.200 bcm or 4,680 million tons of oil equivalent. In this context, oil and gas consumption will grow even in climate-oriented scenario, not to mention increase in gas demand in Asia. And in the Current Policies Scenario oil demand will reach 107 mb/d.



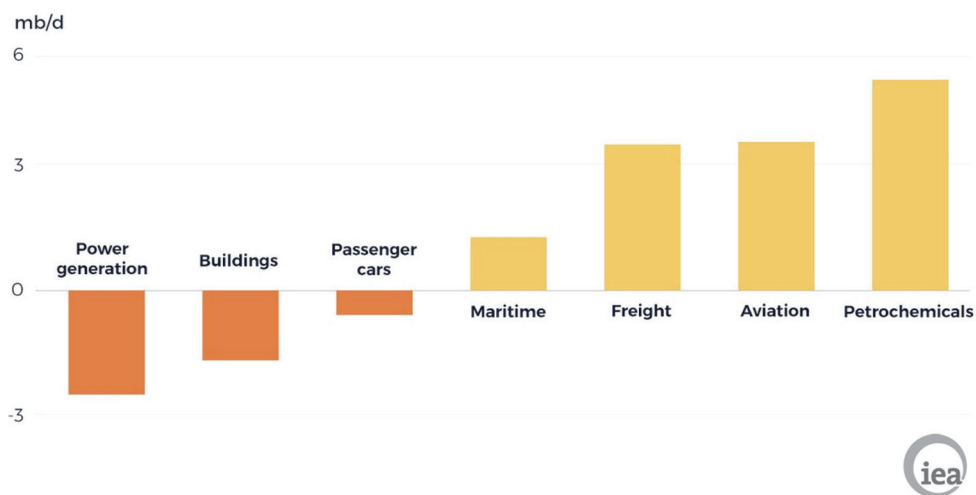
Source: [44]

Fig. 13. Typical stages of development of oil and gas projects

As Fatih Birol, the IEA Executive Director wrote in his Twitter account on January 17, 2017, it is impossible to say that global oil demand will reach its maximum soon. IEA foresees in the next decades a rapid growth of oil consumption in a number of sectors of world economy which will exceed any decrease in its consumption due to the spreading of electric vehicles (Fig. 14).

According to BP estimates of January, 2016 [49], consumption of oil and other types of liquid fuel, including synthetic fuel obtained from gas and coal, and biofuel, will grow by 2035 by 20% and will reach 112 mb/d (about 5,357 million tons of oil equivalent). Gas consumption will grow by 44% to – 4,803 million tons of oil equivalent. Thereby oil and gas share in total world energy consumption will make 55% (29% and 26%, respectively, against 56% in 2014).

Of course, specific volume indicators in the forecasts of various organizations differ, sometimes essentially. But these distinctions do not shade the main thing – in the next decades, as it was already noted hereinbefore, oil and gas will remain a basis of world energy consumption.



Source: [48]

Fig. 14. Change in oil demand by sector, 2015-2040.

However the leading role of hydrocarbon fuel in the world energy balance in the period till 2035-2040 will remain against the background of continuing system crisis and surplus of energy resources.

Accordingly, not energy supply as such, but minimization of total costs of society for these purposes will be the main task in these conditions, that will result in a hardened competitive struggle both between various sources of conventional and nonconventional hydrocarbons, and between hydrocarbon and non-hydrocarbon energy industry in general.

And during each specific time frame of the forthcoming period the society will have to solve, for the purpose of adequate energy supply, a balance optimization task considering not only various demand and supply factors and the required financial resources, but also the latest achievements of scientific and technological progress.

In these circumstances the world energy balance structure will depend on specific features of the structure of the future economy, on combination therein of industrial, neoindustrial and post-industrial development elements. This is the structure of future economy that will determine appropriate energy sources.

Besides, usual dependence of countries importing energy resources on external deliveries will vanish, resulting in a new configuration of relations

between consuming and exporting countries. Already today the role of OPEC decreases. It ceased to dominate in the regulation of world oil prices. Dependence of the world economy on oil supply from the Middle East will be replaced by transition to new technological patterns, development of post-oil economy, priority of energy efficiency and information and technology safety issues.

Besides, possibility of resource development of the Arctic will also influence formation of the energy potential of the planet.

But addressing this major challenge is not a goal in itself. This is a means for joint successful solution of development problems of both North Atlantic, and Eurasian civilizations.

In particular, for an efficient development of hydrocarbon resources on the Arctic shelf either high oil prices, or new, disruptive technologies and technical solutions providing for an essential production cost reduction are required. Measures of concerned states aimed at creation of conditions for profitable development of the Arctic shelf may also play a positive role.

Of course, one may wait until prices go up or until the government lowers or slashes to zero all taxes associated with Arctic projects. But, in our opinion, it is better and more reliable to work on creation of new technologies and technical means.

Such, in our view, is in general the strategy of the world energy development during the period till 2030-2040¹². Respectively, the energy policy of major actors (both governments, and business structures) shall take into account at least three geopolitical, environmental and technological factors:

- world oil and gas trade will remain in considerable amounts, though at shorter ranges: Middle East - Europe; Iran - India; Russia - China without transatlantic and Pacific routes;
- the leading role of energy industry in social and economic development of all countries predetermines creation of large energy highways in Europe and Asia. In the long term we also foresee creation of transeurasian energy pool, in the fashion of the Great Silk Road. Grid system (OES) of Russia, and the Asian Energy Ring megaproject may serve as a prototype of such energy pool;
- the market of new energy technologies will substitute for the trade in resources.

¹² The opinions of experts of the Institute of Energy Strategy on outlooks of development of the world energy industry as of 2010 are given in [51].

3.3. Reasons of oil price falling, energy consumption in some Eurasian countries and eventual possible role of Russia therein

As we stated above, since the middle of 2014, a period of low and high volatile hydrocarbon prices began in the world markets. There are several reasons for that.

It is known that in general oil prices are determined, first of all, by so-called fundamental factors. These are production costs, taxes, cost of financing of oil and gas projects, amount of necessary investments, the need to balance national budgets at growing social and military expenses [50], development of technologies of production of conventional and nonconventional hydrocarbons and energy production from renewable sources, the supply-demand balance in general, as well as policy and geopolitics¹³.

It should be noted that the same factors have the most direct impact on development of the oil and gas industry in general, in particular on amounts and rates of oil and gas extraction and the outlooks of development of this industry.

And, each of these factors in its turn depends on some other (for example, production costs — on mining-and-geological modes of occurrence of the field, availability of transport and production infrastructure, etc.).

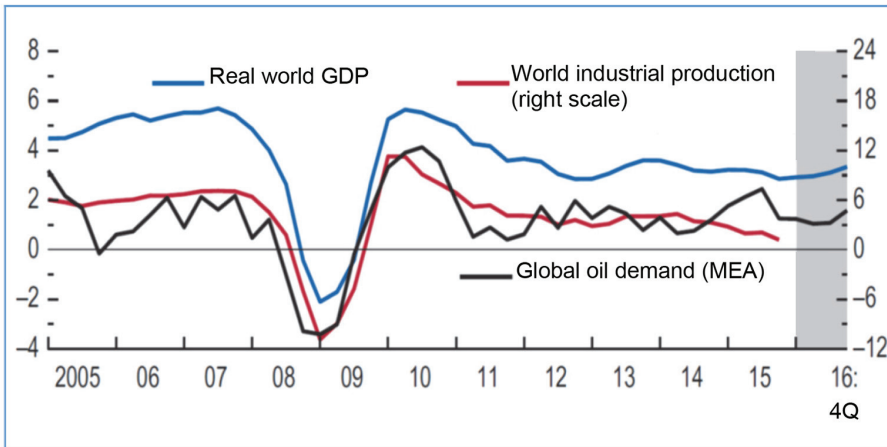
The correlation dependence of the dynamics of world real GDP, world industrial production and global oil demand is demonstrated in Fig. 15.

Fundamental factors of oil pricing also include the rates of economic development of countries that are leading consumers of liquid fuel, as well as cyclic development of the world economy¹⁴.

However oil pricing is very intricate process. Along with the above-mentioned dependence of the world oil prices upon fundamental factors, oil prices react and to a lot of other phenomena and processes, many of which are virtually unpredictable.

¹³ It should be noted that each of these factors is interrelated with many others. So, the oil supply-demand balance is greatly influenced by such factors as OPEC strategy, capability of Saudi Arabia, Iran, Iraq and Libya to increase production, oil extraction rates in the USA, possibilities of Russia and Venezuela to keep stable production levels; improvement of energy consumption efficiency in the main oil consuming countries, delay of growth of world economy, in particular in the EU, India and Brazil, economic downturn in China and its persistence in the future, etc.

¹⁴ In this respect current situation in the world oil market seems to quite fit into the theory of so-called supercycles actively developed by western experts [52-55]. For more details see, e.g. [56 and 57].



Source: [35]

*Fig. 15. Global activity and oil demand
(percentage change as compared to the previous year)*

During the first months of 2016 such events include a terrorist attack on the oil pipeline in Iraq, a strike of oil industry workers in Kuwait, forest fires in Canada. So, fires in Alberta province in May, 2016 resulted in oil production reduction in this country by more than 1 mb/d that entailed oil price surge by almost 2 \$/bbl.

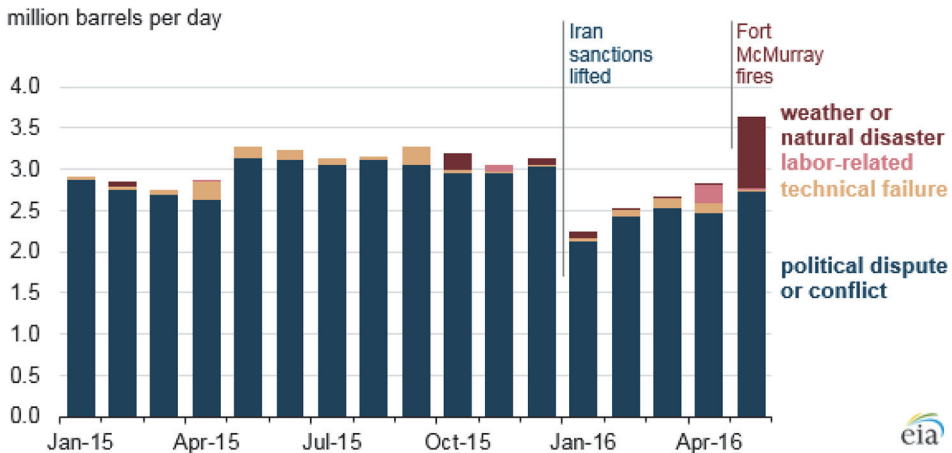
The assessment of the impact of such factors on disruptions in oil supply made by the U.S. Energy Information Administration, EIA, is shown in Fig. 16.

So-called monetary factors also have a substantial impact on volatility of oil prices. Their role especially increased during two last decades when in its development, the world oil and gas market began to assume more and more similarity to stock and commodity exchanges, became complicated and has been becoming to more and more greater extent a part of the uniform financial and economic market.

Integration of the oil futures market with financial and exchange markets culminated in formation of oil price dependence upon dollar rate, profitability of the US treasury bonds, stock indexes, gold prices and prices for other primary goods and made the oil market a market of expectations. At the same time oil market became global in the same degree as financial markets, and now it is affected by the whole set of political and economic

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factors operating in the world. And high volatility of oil market became one of threats to the global energy security as it has an essential impact on economy of producers and consumers of raw materials, on investments into the oil and gas sector and on the entire world financial system, triggering the development of the world financial and economic crisis.



Source: [58]

Fig. 16. Causes of global unplanned oil supply disruptions (Jan 2015 - May 2016)

In particular, such monetary factors as curtailing of the quantitative easing¹⁵ program which was a basic element of the anti-recessionary program of the U.S. Federal Reserve System and an efficient instrument of providing the market with liquidity, as well as expectation by market participants of the discount rate raise, and, as a result, increased crediting cost in US dollars, had considerable impact on reduction of oil prices in recent years. On the

¹⁵ Quantitative easing (QE) is a nonconventional monetary policy, a credit policy tool used by Central Banks to stimulate national economies during crisis when conventional monetary and credit regulation tools (increasing the discount rate, currency interventions, purchase or sale of securities, etc.) do not produce the necessary effect. The essence of the program of quantitative easing consists a sizeable additional issue by the Central Bank of check book money using which it either credits state and commercial banks, or purchases their long-term debt securities (bonds). Thereby there additional funds are injected in the economy, the cost of credit resources reduces, the amount of issued credits increases, production grows, the level of unemployment decreases, purchasing power of population grows that in the aggregate stimulates economic growth. During the period of the first program of «quantitative easing» (QE 1), to rescue large corporations, banks and private enterprises FRS purchased their depreciated debts (mortgage and other bonds) for an amount of \$1.7 trillion.

other hand, many countries with developed economy continue to pursue an ultrasoft monetary policy, and some of them even established negative nominal interest rates though such tool was extremely seldom used in the past. Today it is used in four European countries, and by the Bank of Japan.

Speaking about the reasons of high volatility in the world oil market in recent years, we cannot steer clear of the speculative component of its functioning analysed in the Analytical review of the Foreign Economic Industrial Bank «World oil market» (August, 2011) [59]. And since the speculative component has a considerable impact on stock exchange quotations, local psychological factors also influence the market. However, not all experts agree with this thesis. So, the experts of VYGON Consulting company believe that by this moment there are no proofs of a big role of financial speculation in price fluctuations [60].

Overall impact of various factors on oil prices, as viewed by the experts of the American Petroleum Institute, is presented in Fig. 17.

Among all these factors a special role belongs to growing oil production in the USA, first of all, oil extracted from dense formations and low-permeability collectors, since oil extraction from conventional sources decreases quickly, as it was already mentioned in section 3.2.

A role was played also The shift of the center of growth of consumption of world energy resources to Eurasian states where new global-scale industrial and financial centers have been emerging by rapid leaps.

As of today, Eurasia accounts for about 70% of total world energy consumption, including more than 84% of global demand for coal, 63% for oil and 62% for gas, 62% of consumption of electricity generated by nuclear power plants and hydroelectric power plants, 68% of energy obtained from other types of RES [16]. In the forthcoming decades we may expect an essential growth of energy consumption here, first of all on account of China, India and some other countries. The development of energy-saving technologies and new energy sources will also receive new incentives. These processes will be followed by the development in the region of infrastructure for transportation, processing and use of oil and gas. A new role of South Asian countries is also discernible: without refusing the import of energy resources, they have been for and more focusing on integrated development of the energy industry (atomic energy, RES, water supply, etc.) to solve social tasks and to handle challenges of the new energy civilization.



Source: [61]

Fig. 17. Many factors affect the price of oil, but in the end it comes down to supply and demand

However, these achievements will not be able to satisfy completely the growth of energy demands of the entire region. The Eurasian countries will look for the solution of their energy problems in international cooperation. And Russia can play a prominent role here. In particular, thanks to a wider entry of Russia into the Asia-Pacific markets by the middle of the 2020s we may expect a new stage in the development of energy export from Russia.

However, today, despite high degree of involvement of the branches of the Russian energy industry into world economic relations, and relative territorial proximity of the resource regions of Siberia and the Far East to Asia-Pacific, supply of energy carriers and energy to the Asia-Pacific market do not play an essential role in the export of Russian energy resources yet. They do not exceed 10-15% (except for coal with 23%) of Russian deliveries of these products to the world markets. The basic reason is the lack of transport infrastructure and poor development of the resource potential (including energy one) of the Eastern Siberia and the Far East, as well as the East Arctic.

And meanwhile «the East vector» is proclaimed a priority area of development of the energy industry of Russia in the first half of the 21st century. Such a turn in the energy policy of Russia reflects its role as a major European power on the subcontinent influencing, not least of all, sustainable development both on the regional, and on the global scale.

The role of Russia as a transport and energy bridge between the East and the West is not less important. Covering a huge part of the Eurasian continent and adjoining to the South Asia, the Russian Federation may be a reliable logistic link between the countries and the regions rich with energy resources. In territorial terms, we can talk about the Middle East, the Central Asia, as well as the Western Siberia, and the Arctic Ocean shelf.

Against the background of geopolitical tension between Russia and the West we also cannot disregard the issue of western sanctions and trade restrictions against Russia. Their negative effect should be taken into consideration at development of the energy policy of the country. The draft Energy Strategy-2035 contains in particular answers to new geopolitical challenges in the field of energy industry. In our opinion, the development of the energy strategy should be based on the thesis that the energy industry is, first of all, a social sphere and only in the second turn a socio-political one. Therefore factors of social and political (including geopolitical) development which dictate requirements to the energy industry, should be regarded as demands imposed on the energy industry on the part of the society.

As it was emphasised above, the central task set by the draft Energy Strategy-2035 is the transition from the resource-and-raw materials based to the resource-and-innovation based development of the fuel and energy complex. The target of the energy strategy of Russia for the period till 2035 is the creation of an innovative and efficient energy sector of the country for a strong growth of the national economy, improvement of quality of life of population and strengthening of its external economic positions. And energy security, energy and cost efficiency, and sustainable development of the energy industry have to become its main reference points.

The major geopolitical challenge for the Russian energy industry is drastic toughening of the situation and competition in the foreign energy markets. The Russian energy industry has to withstand a serious competitive struggle to retain and increase its share both in traditional, and in new energy markets.

4. GLOBALIZATION AS A FACTOR OF UNCERTAINTY OF DEVELOPMENT OF THE WORLD OIL AND GAS INDUSTRY¹⁶

As it was already noted above, the most various, often multidirectional, factors, have an impact on amounts and rates of oil and gas production and the industry development outlooks, and most of them are interrelated and interdependent that raises the degree of uncertainty of their cumulative influence.

Along with fundamental factors, such as demand-and-offer, price, technical and technological, etc., in the last decades the influence of political and geopolitical factors on the development of the oil and gas industry have been increasing. The last example is the election of a new US president which was followed by a huge number of publications in mass media and specialized printed matter under a common refrain «Trump as a new factor of uncertainty in the development of the oil and gas industry».

In a number of publications [32, 63, 64] we have already – either directly or indirectly – drew the reader’s attention to the fact that the oil and gas sector is the most important of present-day global economy. But just a «component» which evolves in the context of totality of the world economic relations, in close interaction with other branches of the world economy and the energy industry. Therefore it is virtually impossible to understand mechanisms, directions and outlooks of development of the world oil and gas industry, the logic of changes of priorities of its development in isolation from the global energy industry and economy.

The relevance of the analysis of opportunities and outlooks of the development of the oil and gas industry in the context of the development of the whole global economy especially increased in the last decades due to quickly progressing basic changes in the whole system «economy – energy – ecology».

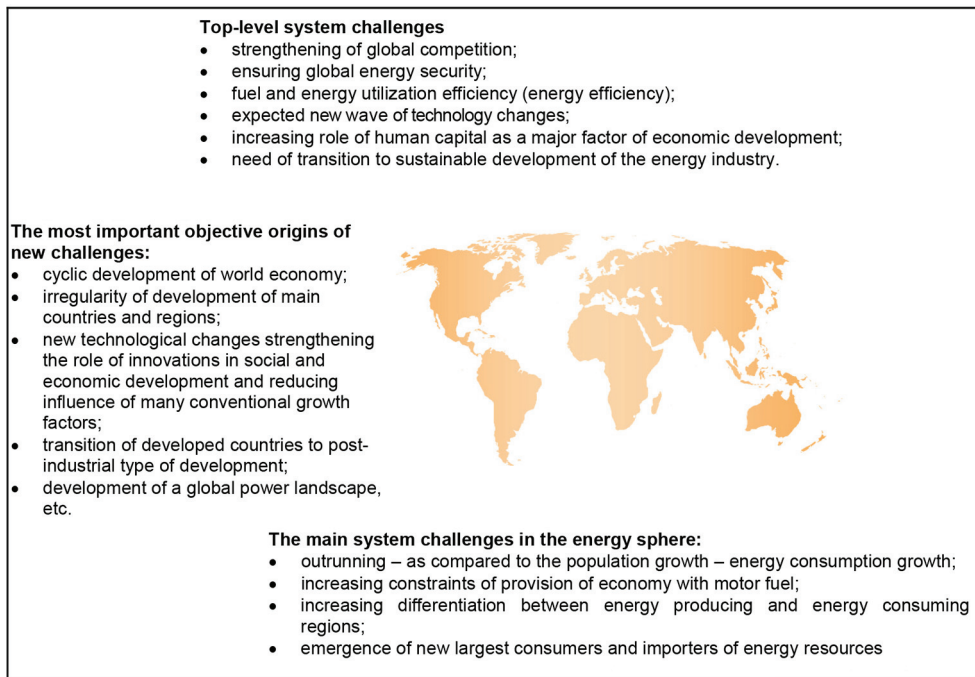
In its turn, the development of global economy is conditioned not only by especially economic factors, but also by the whole set of social, economic, political and geopolitical circumstances. A wide range of factors of uncertainty in the development of production and consumption of hydrocarbon resources is associated with this fact. And the globalization factor is perhaps the most important of them. Let’s consider it in more detail.

¹⁶ Based on materials of [62], as well as [18, 24].

4.1. The world on the brink of global shocks

We talked and wrote many times¹⁷ about accruing changes in the world economy, that the humankind faces serious challenges, in particular in the energy sphere, which have to be adequately handled, that the world is on the threshold of global system crisis, global shifts and changes of not just technological, but also civilizational structures, since the research of these processes has been conducted by the Institute of Energy Strategy for many years.

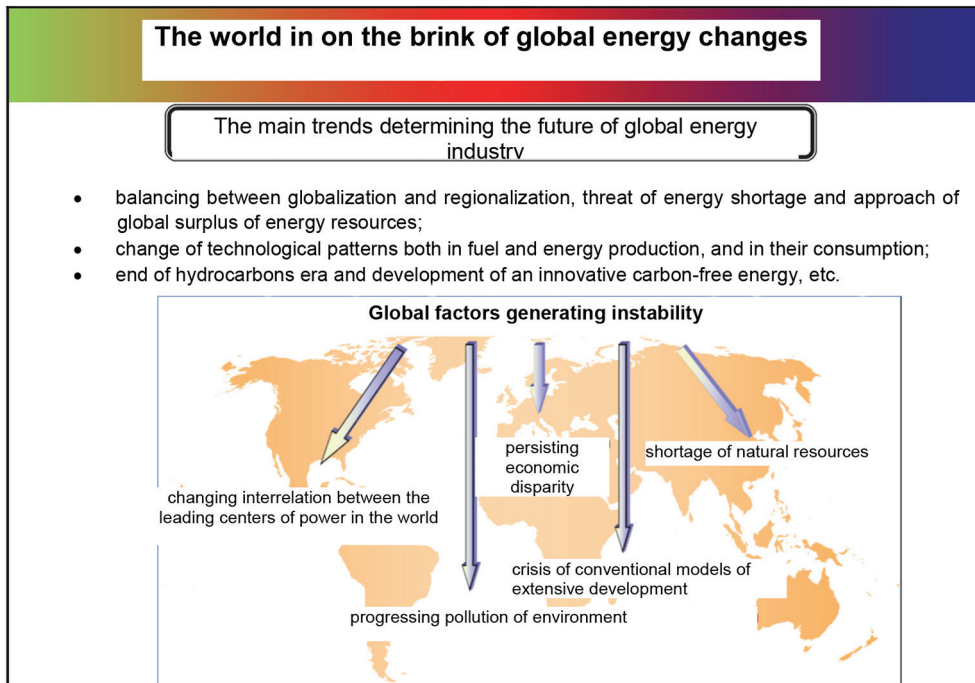
We also developed a summary matrix of these challenges having, as a rule, simultaneously geopolitical, resource, macroeconomic, ecological, technological and social character (Fig. 18), as well as of trends and factors generating instability (Fig. 19).



Source: [21]

Fig. 18. Challenges facing today's energy industry, and their most important objective reasons

¹⁷ See, e.g., [6, 8, 19, 65-68], etc.



Source: [21]

Fig. 19. The main trends determining the future of global energy industry and factors generating instability

Numerous researches carried out by Russian and foreign experts in recent years [69-74, etc.], furnish convincing proofs of, and develop the following our conclusions drawn a few years ago [5, 6, 19, etc.]:

- the world is on the brink of a system crisis covering both economy and energy industry, and policy, on the threshold of a change of basic paradigms of its development and global energy changes, including international relations;
- global changes, and serious qualitative shifts in the development of the world energy industry have been started, developed and already proceed;
- at the same time global factors generating instability – changing interrelation between the leading centers of power in the world, persisting economic disparity, shortage of natural resources and crisis of conventional models of extensive development – remain.

It will just suffice to mention the name of a joint survey published in 2016 by the Russian-American group of authors representing the Institute of World Economy and International Relations of the Russian Academy of Sciences and the Strategic Forecasting Group of the Brent Scowcroft Center on International Security (The Atlantic Council): «Global System on the Brink: Pathways toward a New Normal». The survey stresses: «The world is in an extremely dangerous point today – a change point» [70]. This assessment is close to the assessment of the authors of the report «Dispassionateness instead of confrontation: post-European Russia in search of self-sufficiency»: «The whole paradigm of the world configuration changes, it is in an extremely unstable state...» [75]. And even more careful politicians and experts agree on a transitional state of the modern international relations system [69].

And, as it is emphasised by certain authors [76], in particular in publications of the IES [11], synchronism and uniformity of crisis processes in various countries and regions of the world clearly testifies to the fact that at the heart of all individual and separate events is the crisis of the world civilization. And within the framework of this crisis developed and deepened are local crises of particular countries and regions which missed historical time to shift to new types of the system (resource and sociocultural) energy potential of development, because certain people, countries, and unions of countries failed to find adequate answers (innovative in energy, technological, social and cultural terms) to new civilizational challenges of the history.

Accordingly, the future of the global energy industry, as well as the future of the whole world economy, will be determined to a great extent by such trends as (Fig. 19):

- balancing between globalization and regionalization¹⁸, threat of energy shortage and approach of global surplus of energy resources;
- change of technological patterns both in fuel and energy production, and in their consumption;
- end of hydrocarbons era and development of an innovative carbon-free energy, etc.

¹⁸ Continuing globalization development processes creating global production chains closely intertwined with regionalization processes the purpose of which is the formation of relatively self-contained regional unions. As it is fairly noted in [78], «Gradual transfer of economic cooperation and integration to the level of regions does not cancel globalization. Global and regional institutions and schemes shall supplement each other instead of weakening».

At the same time globalization expands, and global factors generating instability and uncertainty remain. These include, first of all, changing interrelation between the leading centers of power in the world, persisting economic disparity, shortage of natural resources with their continued wasteful expenditure, progressing pollution of environment, especially with waste products, and crisis of conventional models of extensive development (Fig. 19).

The following external economic risks, trends and factors will also have a profound effect on future world development [77]:

- aggravation at the present stage of globalization of some problems that cannot be coped with by the existing international institutions properly. First of all they include a threat of intensification of the world financial and economic crisis; persistence and even deepening of imbalances and accumulation of disproportions in the world trade, in capital flow, in restructuring of the world economy and the world financial system as an important potential of sustainable development of civilizations;
- growth of uncertainty of the world development caused in particular by an increased number of countries which determine the world economic dynamics. The new centers of power make a growing impact on all world economic trends, change configuration of the world trade, of the currency sphere, of capital and manpower flows - new potentials of the world energy industry civilization;
- acceleration of changes of some key world economic trends due to the activation of innovation processes;
- and, at last, various economic sanctions which even more often become a tool in the global policy.

Besides, growth of wealth disparity and, as a result, polarization of society becomes the most serious risk for future development of the world economy, which was ranked the 1st by the experts of the World Economic Forum among the most probable risks for several years in a row – in 2012, 2013 and 2014 [79] (Fig. 20)

According to the last report of Credit Suisse, more than a half of the world welfare (50.8%) is owned by 1% of superwealthy men, more than three quarters (77,7%) – by 5% of the richest, and nearly 90% – by 10% of the most prosperous – the proportion was approximately the same at the beginning of the century. Figures provided by the international charitable

organization Oxfam International are even more terrible. According to its report published on January 16, 2017, 1% of the population of the planet owns today bigger wealth than other 99%. The fortune of eight richest businessmen of the world equals that of about 3.6 billion people in the world, or about a half of the Earth population. The income of the poorest 10% people of the planet increased during the period from 1988 to 2011 by less than three dollars per year [80].

Risks associated with inequality and polarization of society will continue to increase in 2017. And the development of robotics will force out human labour from the services sector: whole communities lose workplaces that provokes political discontent in post-industrial regions. The scales of the phenomenon is confirmed by the fact mentioned at the SPIEF-2016: Adidas is going to transfer Chinese plants to fully robotized factories in Germany. As a result, more than 1,200,000 people in China will lose jobs within six years. At Chinese factories you may see safety grids installed on windows because after receiving a dismissal notification people jump t windows. This is a mass phenomenon, and there is even a business of installation of such grids at factories [81].

	1ST PLACE	2ND PLACE	3RD PLACE	4TH PLACE	5TH PLACE
2012	Inequality of income	Budget deficit	Growth of greenhouse gas emissions	Cyber crime	Shortage of fresh water
2013	Inequality of income	Financial misbalances	Growth of greenhouse gas emissions	Water supply crisis	Mistakes in pension coverage
2014	Fiscal crises	Unemployment	Shortage of fresh water	Social stratification	Climate change
2015	International conflicts	Extreme weather events	Inefficiency of state administration institutions	Disintegration of state	Unemployment
2016	Climate change	Use of mass destruction weapons	Water supply crises	Large-scale forced migration	Falling of oil prices
2017	Extreme weather events	Large-scale forced migration	Natural disasters	Large-scale acts of terrorism	Climate change

Source: [79] with reference to the World Economic Forum

Fig. 20. Top-5 risks of world stability

4.2. Globalization and its influence on the world energy industry

Let's note also that globalization plays a twofold role in the future development of the energy industry and its oil and gas branch since its impact is both direct, and indirect.

As early as in 2010, speaking at the Ninth forum of the «Club of Nice – Energy and Geopolitics» – one of authors of this book noted that globalization in the energy sphere involves not only energy markets and energy resources, but also such areas and forms of activity relating to the energy as [65]:

- globalization of markets of energy technologies and equipment on the basis of international specialization and cooperation;
- formation of a single global system of energy information, knowledge and know-how based on unification of national information systems and liberalization of access to national energy information resources;
- standardization of the national energy legislation, standards, technical rules, etc., including those relating to environmental protection at energy production and use;
- formation of international energy organizations and associations and strengthening of their role.

Globalization of the world energy markets as a reflection of further technological development and development of social institutions is a natural stage of their evolution. The ultimate goal of development of energy markets is the creation of the global energy space with uniform «game rules». And those who establish such rules, will be more comfortable to follow them. Therefore already now, many years before the creation of such space, there is a fight for future key positions therein.

Globalization of energy resources materialize, first of all, in possibility of access to them of multinational corporations, in possibility of their use not only in the interests of the country of origin, but also for the benefit of other countries.

Globalization brings new challenges for the humankind, but it also gives it new opportunities for the solution of the most challenging problems.

It should be noted that most challenges are interconnected and interdependent, therefore any their classification is in some degree objectively conventional. Nevertheless, system challenges covering not only all business activities of the humankind, but also its socio-political aspects

are the most serious ones within the set of challenges facing modern energy industry. This is, so to say, the upper, determining level of challenges¹⁹.

Such challenges first of all include:

- strengthening of global competition;
- ensuring global energy security;
- fuel and energy utilization efficiency (energy efficiency);
- expected new wave of technology changes;
- increasing role of human capital as a major factor of economic development;
- need of transition to sustainable development of the energy industry.

The next level of challenges relates directly to the energy sphere, covering production, distribution and consumption of energy resources though, taking into account complexity and interdependence with other spheres of human activity, some of them could have been referred to system challenges.

In the world energy industry new challenges include, first of all, an outrunning – as compared to the population growth – energy consumption growth; increasing constraints of provision of economy with motor fuel; increasing differentiation between energy producing and energy consuming regions; emergence of new largest consumers and importers of energy resources, etc²⁰. Along with the above-mentioned system challenges they cause aggravation of competition for the right of access to energy resources, increasing threats for the global energy security and the risk of global economic chaos.

As for those new opportunities which are born by globalization, they include, most notably, concentration of the world intellectual and financial resources; creation of new production technologies, production, transport and use of energy resources; awareness of a need for careful attitude towards

¹⁹ Some authors refer to such system challenges also cross-border energy overflows and transit of energy resources, investments and financing of projects, etc. (see, e.g., Steivan Defilla – «Modernisation de la Charte de l'énergie face aux nouveaux défis mondiaux». IXe Forum Énergie et Géopolitique. NICE, 6-8 Décembre 2010). However, in our opinion, cross-border overflows, transit, investments and financing of projects are not so much independent issues, as a part or aspect of other system or directly energy challenges.

²⁰ Some authors include in such challenges also doubling (trebling) of global energy consumption by the middle of the century; growth of the organic fuel market pressure index; hydrogen energy; restriction of harmful emissions in the atmosphere, etc. (see e.g. Eduard VOLKOV «Les nouvelles technologies dans le monde de l'énergie électrique et les travaux dans la sphère russe». IXe Forum Énergie et Géopolitique. NICE, 6-8 Décembre 2010).

environment and cardinal changes in the world financial sphere. All this may promote the development of the international energy cooperation and alleviation of threats for the global energy security and the risk of global economic chaos [65].

The aforesaid make obvious the direct role of globalization in the future development of the energy industry. This is, in the first place, the influence of globalization on demand and supply of energy resources through the formation of a uniform (all-planetary) information and economic space, of a qualitatively new system of international labour division, in particular in the energy sphere.

It should be noted also that under conditions of globalization the energy security understood primarily as a reliable and uninterrupted supply of consumers with fuel and energy in required amounts and of required quality at economically reasonable prices, acquired a new – global – scale and became one of the most essential components of global safety. At the same time ensuring global energy security became one of the main system challenges facing the modern energy sector²¹.

Under the influence of globalization the structure of the world economy considerably changes due to distinctions in the growth rates of developed and developing economies. The fact that new industrial countries and countries with emerging markets will grow quicker than developed countries, will create more and more imbalances both in the world energy markets, and in financial systems of these countries. Under these conditions the global energy sector will be in a situation of price and investment uncertainty²².

Increasing social globalization (growth of labour force mobility) will create still better conditions for new technology breaks almost in each industry [70], including the energy industry.

The growth of price uncertainty in the world energy markets²³ will be also influenced by such globalization-related factors as [70]:

- transition to a multi-level, polycentric regulation system which will be able to balance and stabilize the large-scale global financial system developing much faster than the real economy;

²¹ For more details see, e.g., [82].

²² For more details see [70].

²³ About the role of the price factor in the development of the oil and gas industry see, e.g., [22, 23, 25, 83, 84].

- development of free trade areas, common markets and monetary unions²⁴;
- diversification of technologies and energy sources, as well as improvement of energy efficiency in the developing world.

As for the indirect impact of globalization on the outlooks of development of the oil and gas sector of the world economy, according to the scientists of the Institute of World Economy and International Relations of the Russian Academy of Sciences and the Brent Scowcroft Center on International Security (The Atlantic Council): [70], it will manifest itself in the following:

- despite numerous benefits, globalization bears serious risks considered by some political elites as social, political and economic threats. These risks include in particular washing out of national sovereignty and risks of economic crises²⁵;
- new technologies, such as robotics and automation, will bring about reduction of workplaces, provoking social and political protest against existing national and multilateral tools;
- depth and scales of changes transforming the global landscape will inevitably demand establishment of a new world order. But what it will be?²⁶

²⁴ Ideas of creation of new trade and economic megablocks are advanced both by the Western countries (Trans-Pacific Partnership and Transatlantic Trade and Investment Partnership), and other countries of the world (BRICS, Asian Infrastructure Investment Bank, the extending Shanghai Cooperation Organization, the Eurasian Economic Union, Regional Comprehensive Economic Partnership (initiated by China), etc.). As A.I. Miller and F.A. Lukyanov note, «their emergence reflects the general tendency – fragmentation of the global economic and political space, abandoning the idea of universalism (based on the western principles) which dominated after the victory of the West in confrontation with the USSR». For more details see [75].

²⁵ «The globalization paradox» described by Dani Rodrik (impossibility to combine all three components at the same time – participation in the global economy, sovereignty and democracy), shook foundations of political structure in countries-leaders. [75].

²⁶ One of authors of this book in the above-mentioned report at the IX Forum «Club of Nice – energy and geopolitics» also drew attention to inevitability of formation of a new world order. In particular, he answered his rhetorical question «And what will be this new order? Will it put an end to the fight for energy resources or on the contrary, strengthen it, giving rise to armed conflicts?»: «Only time will give the answers to these questions» [65]. However, authors of the report at the International Discussion Club «VALDAI» are more categorical: Today the new order is not built on post-war ruins, but gradually «sprouts» from dialectic chaos of rivalry and interdependence. The balance of winners and losers cannot be the cornerstone of the future world order. Winners of cold war will not sit down at the negotiating table with those who are dissatisfied with the results. The West will never recognize equality of the others – both moral, ideological, and political, it will interfere with establishment of a new international system structure. The feeling of not only own indisputable force, but also absolute moral and political righteousness at the end of the 20th century was too sweet. But it is impossible to return in the 1990s so nice for the West [78].

- the nature of globalization changes, creating more unstable global environment in which the distance between the center and the periphery of the world economy increases;
- globalization mitigated distinctions between developed and developing countries, but deepened economic disparity eventually in all countries;
- with an increase of geopolitical tension increases also the probability of armed conflicts with participation of some leading oil-producing countries of the Middle East and North Africa, and even escalation of conflicts into a regional nuclear war between second-tier nuclear countries.

Unfortunately, today it is possible to assess the impact of globalization on the development of the world energy industry (and the world economy as a whole) only at a qualitative level. As it was fairly noted by the authors of the report «War and peace of the 21st century. International stability and balance of a new type» prepared within the framework of the International Discussion Club «VALDAI», «Everybody understand that fundamental changes are coming, but nobody is able to comprehend them yet or at least to outline the future» [78].

Speaking about a new world order, the scientists of the Institute of World Economy and International Relations of the Russian Academy of Sciences and the Brent Scowcroft Center on International Security (The Atlantic Council) emphasize that a new bipolarity would become the worst outcome: emergence of a group around Russia and China opposing the USA and their European and Asian allies. However, as the experts of VALDAI club note, the world moves just in this direction: «Most likely, we are witnessing the beginning of formation of a new world structure based on actual, though not formalised, balance of two big groups of countries. These two groups are not doomed to confrontation. They will maintain close economic and human relations among themselves, will try to tackle together the issues and challenges of the development, sometimes they will even fight together against threats, first of all, of anti-system character. But all this does not exclude that they will be in a state of permanent competition» [78]²⁷.

²⁷ Some scientists consider this process to be a new branch of science and even invented a name for it – geopolitical economy. As, for example, Radhika Desai, Professor at the Department of Political Studies and Director, Geopolitical Economy Research Group, University of Manitoba, Winnipeg, Canada, states: «Geopolitical economy is a science about multipolarity, a science most suitable for explanation of the decline of hegemony of the West and the USA and formation of a multipolar world. It is also applicable for the development of a scientific basis for activity of institutions and creation of practices aimed at using multipolarity potential for the benefit of equal and fair world» [85].

In general it is possible to agree that the world order of the 21st century will form in a bitter struggle of the old and new, in opposition between descending and ascending powers, between established and newly created international institutions, between winners and losers in the course of globalization [71].

4.3. Some words about development of globalization in the forthcoming decades

Within the next 20 years driving forces of globalization will remain the same (Fig. 21).

The tendency to concentration of wealth, knowledge, technologies, human capital within very small territories [86] will also remain, since globalization implies not only growth of opportunities, but also restrictions (of sovereignties, civil rights and freedoms), not only benefits, but also new forms of resistance, conflicts and counter movements.

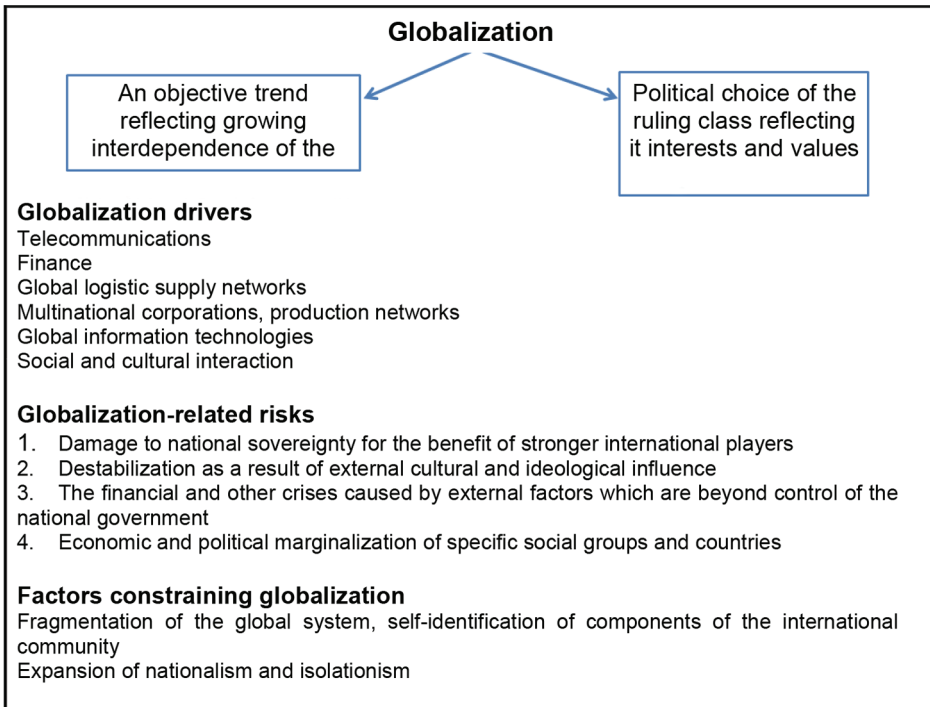
At the same time globalization stimulates other, first of all economic, factors: rates of economic growth, property structure, models and instruments of attraction of capital, savings ratio, accumulation and investment, debt burden, relationship between public and private finances, internal and external sources of financing of economic growth, macro prudential supervision and alleviation of systemic risks, etc.

In general even short and, frankly speaking, rather surface analysis of the influence of globalization on the development of the oil and gas sector of the world economy carried out by us testifies that not only globalization is currently and will remain in the coming decades the main source of uncertainty in the development of the oil and gas sector, but it is also a kind of catalyst of other factors of such uncertainty – both macroeconomic, price-related, technological, and even political and geopolitical, including the global climate change issue.

Globalization creates conditions for formation of a cumulative energy potential of the world development including both natural resources, and sociocultural, intellectual and technological capabilities of various countries. In order for these components of the development potential to operate without contradicting each other, but «in unison», the globalization should not destroy specific features of particular countries, but rather put together

the overall picture of the new energy civilization from such separate «puzzle pieces» supplementing each other.

Thus, globalization acts with respect to the energy sector of the world economy and the new energy civilization in general as a kind of macrofactor the action which it to be comprehended yet and carefully investigated, in order to identify in the globalization processes not only problems and challenges, but also new opportunities, and historical chances for Russia.



Source: according to [70]

Fig. 21. Characteristics of globalization in the forthcoming period

5. ENERGY SECURITY IN EURASIA AND GLOBALLY: SEARCH FOR SOLUTIONS IN THE CONTEXT OF NEW CHALLENGES²⁸

5.1. Energy security as factor of today's world

Ensuring global energy security is one of the main system challenges facing the modern energy industry. These challenges and their most important objective causes are presented in Fig. 18. Under conditions of expansion of the processes of globalization and liberalization of the world economy and energy industry, energy security – primarily understood as a reliable and uninterrupted supply of consumers with fuel and energy in required amounts and of required quality at economically reasonable prices, assumed a new, global value and became one of the most relevant components of global safety. At the same time energy security is also the most important component of energy policy and national security of most countries.

As a matter of fact, energy security in new conditions means not only provision with resources, but in a wider sense – a steady and expanded reproduction of the whole energy potential of development of the civilization, including energy technologies, infrastructure, ecological priorities, sociocultural factors and human capital.

Such plurality of components of energy security impacts both development of approaches to its definition, and the methods and means of its provision, especially as nowadays the concept «energy security» significantly extended and includes safety in political, ecological and infrastructural areas, and even terrorism and climate change issues, being, according to some experts, a kind of «public benefit» [87, 88].

It was by no means at once that humankind to the understanding that energy security is a global problem that it is impossible to solve not only individually, but even in cooperation with a partner. It realised this fact through the comprehension of a long experience of solution of the energy security issue both in the EU, in the USA, and in other countries and regions of the world. However, this new understanding is still from time to time questioned and is not shared by all politicians.

At the same time the understanding grows that the humankind lives in a globally interdependent world; that the energy security system have

²⁸ Based on materials of [21, 82, 89].

to ensure reliability of supply of energy resources in common interests of the world economy, to the benefit of all countries – both consumers, and producers of energy resources; that this system has to be transparent, be based on international law and responsible policy in respect of demand and supply²⁹. The understanding of the fact that in the world energy sphere there is no universal, recognized at the international level body the competence of which would include discussion and search of solution of various energy problems, including the problems of ensuring global energy security also grows. What is more, today problems of national, regional, world energy industry security become more complex: the competition for access to resources becomes tougher, state regulation and control both in the energy markets including the market of new technologies, and on the routes of transportation of energy carriers increases, the extent of inadequate reaction to threats of energy security from governments of some developed countries, first of all the USA, grows.

Generalizing available results of researches in this area and the practice of solution of arising problems connected with ensuring energy security, it is possible to draw a conclusion that system challenges shown in Fig. 18 are the main threats to global energy security at the present stage. These challenges covering not only all business activities of the humankind, but also its socio-political aspects, determine the deep nature of major threats to reliable and uninterrupted energy supply of the humankind.

At the same time grows also the understanding that low energy efficiency of economies of developing countries, as well as overconsumption of energy-intensive material benefits in economically developed countries resulting in unreasonable increase in demand for energy resources are another global threat to the energy security. The energy supply process should not cause negative effects for the environment, or its destruction. As a consequence, the problem of global energy security has been receiving more and more attention in the context of sustainable development of economy and the humankind in general.

²⁹ So, in the EU document «Green Paper. The European Strategy of Steady, Competitive and Safe Energy» approved by the European Commission in November, 2000, it was noted that in a new energy landscape of the 21st century economic regions of the world depend upon each other in terms of ensuring energy security and stable economic conditions, as well as in terms of taking efficient measures to counteract climate change. For more details see [89a]. Later, in 2006, in anticipation of the St. Petersburg G8 summit the president of the European Commission José-Manuel Barroso drew the following very important conclusion: «Energy security is a global problem which requires global solution» [90].

However along with that a dangerous trend of politicization of energy markets for the purpose of their use as geopolitical tools gains steam. The world markets of energy resources are constantly strongly influenced by non-economic factors that strengthens conflict potential and mistrust of market participants to each other, forces to look for alternative, often very expensive, solutions of problems. The principle of diversification of sources and routes of supply of energy carriers which is the cornerstone of many energy strategies, so nice in theory, in the real life provokes strengthening of geopolitical rivalry between countries. In the energy diplomacy it becomes a common practice to designate whole regions as «critical in ensuring international energy security».

5.2. Formation and development of the concept of energy security and measures to ensure it

Generally, the problem of energy security is predetermined by uneven distribution across the territory of the Earth of various types of energy potential, including natural fuel and energy resources, and territorial mismatching of the main energy consuming and energy producing countries and regions in specific social and economic conditions of development of the humankind. This causes shortage of some countries (territories) in fuel and energy and their dependence on countries or regions exporting energy resources.

For the first time the problem of energy security (energy wellbeing) was vividly realized in industrialized countries with market economy in 1973–1974 when the Middle Eastern crisis resulted in a tendency of sharp reduction of oil export from this region to industrialized countries at simultaneous rapid growth of oil prices. Under conditions of essential, and for some countries critical, dependency of energy and especially oil supply upon oil import this culminated in the largest energy crisis³⁰.

Thanks to the measures taken at the national and interstate level as well as at the level of corporations and business in general this problem was temporarily resolved.

³⁰ These questions are considered in detail in some our publications [8, 68, 91-93 and others], but since some of them were published a long time ago, and others – in small circulation, certain extract therefrom would be quite reasonable for a better understanding of particularities of the present stage of ensuring energy security.

The main measures taken at that time were:

- coordination of energy policy, in particular within the International Energy Agency (IEA) created especially for these purposes;
- an active energy saving policy in countries consuming energy resources;
- broad involvement in the energy balance of own energy resources, alternative to imported oil;
- adoption in some countries of state programs for supporting researches in the field of renewable energy sources, as well as more active use of national energy resources;
- use of new technologies expanding possibilities of development of nonconventional resources in the field of energy production and consumption.

Among the latter the development of nuclear energy, oil production on Alaska and on the North Sea shelf, the use of renewable energy sources, as well as state support of coal industry in some the countries are especially worth mentioning [94].

Measures intended to strengthen energy security also included diversification of import of hydrocarbons on account of other exporters – Mexico, the USSR, Africa, Southeast Asia, as well as creation of strategic oil reserves.

In the 1970s the World Energy Council gave a classical definition of energy security given: energy security is a confidence that energy will be available in amount and of quality required under given economic conditions [95].

In the 80s of the 20th century the main center of research in the field of energy security shifted from the World Energy Council to the IEA. In 1985 IEA publishes a work on technological policy in the field of energy [96] in which energy security is determined as «sufficient supply of energy at reasonable prices».

Later this thesis was developed by the European Commission [97] which, however, saw the main emphasis in ensuring energy security in creation of strategic oil reserves. However both definitions – that of the IEA, and that of the European Commission were rather difficult to be put into practice. What is – «sufficient» supply»? What are «essential requirements»? And there were quite a number of such questions³¹.

³¹ See, e.g. [98].

At the same time there is an active discussion among western experts concerning «reasonable» prices. The «reasonable price» or «reasonable cost» criterion require detailed explanations. It is remarkable that in the document «Our Joint Goals» approved by the ministers of IEA member countries at the conference on June 4, 1993 in Paris, reasonable cost was determined as a price of free transactions of market forces which would ensure «sufficient supplies» which would be available at this price [99].

Nevertheless, by the middle of the 90s neither the concept «energy security», nor the respective term did not obtain official recognition.

At the turn of the 20th and the 21st centuries the views of leading foreign experts and research centers on the energy security problem changed drastically³² due to the following reasons:

- the politicization of the problem associated with global opposition of two systems (capitalist and socialist) decreased;
- a new factor appeared – the international terrorism;
- the energy policy of leading developed countries changed. Under conditions of excess of the energy resources offer over their demand and relatively low fuel and energy prices the issue of increasing energy efficiency for many years faded into the background;
- the discipline of implementation of decisions taken by OPEC member countries decreased.

Under these conditions developed countries – importers of energy resources began to associate even more often the concept of «energy security» not so much with policy of comprehensive protection of national economy against eventual interruptions in fuel and energy supplies, as with guarantees of obtaining them from foreign sources in exchange for providing to exporters access to their energy markets. In other words, the understanding of the fact that the energy security issue shall be solved through economic cooperation.

Advisory Meeting «Russia – Europe: Energy Security Strategy» organized by the Security Council of the Russian Federation in Moscow on June 6-7, 1995 at the initiative of the World Energy Council and the Moscow International Energy Club. It was on that Meeting, in the report of the Minister of Fuel and Energy of Russia Yu.K. Shafranik, that the energy policy of Russia, including energy security matters, was presented from the

³² See, e.g. [100, 101], etc.

point of view of the uniform Euro-Asian energy space – for the first time at such a high level [102]³³.

The paramount importance of this Advisory Meeting in the forming of understanding of energy security consists in the following.

First, the future motto – «Safety through partnership» – was developed: meaning that it is possible to prevent a negative impact of growing dependence of national energy supply upon import of energy resources on the level of energy security by shifting from trade in energy resources to cooperation in energy supply on the basis of mutual trust, mutual interest and a firm political will.

Secondly, participants of the meeting were unanimous in opinion that stability of energy supply and, therefore, energy security of the entire European continent both at that time, and especially in the long term would be determined in many respects by stability and efficiency of financing, as well as possibility of further development and improvement of the Russian energy industry and the rates of rerailing of the Russian economy to the energy saving track of the development.

And, at last, the Meeting suggested the creation of a standing consultative body for coordination of policy aimed at increasing energy security on the European continent. Subjects of consideration of such consultative body consisting of high-level representatives of interested countries could include creation of interstate gas and electricity transportation mainlines, ensuring their survivability, forecasting and carrying out coordinated policy, further development of the European energy security concept. Such body could function at the UNECE Energy Committee, or at the IEA, subject to the solution of the question of equal participation in this body of countries which are not members of the IEA [102]³⁴.

It should be noted also that prior to 2010 much consideration to energy security issues was given at G7/G8 summits. However, confirming their commitment to already hardened beliefs regarding this problem, G7/G8 leaders paid main attention to the increase in oil prices, urging oil-producing countries «to ensure a transparent and stable investment climate favourable to the expansion of production capacities» [68, 93].

³³ Opinions of that time of Russian experts including authors of this book on energy security issues and the ways of its provision are given in [103].

³⁴ However at that time plans of creation of such body ended in talk. These ideas gained currency only in the 2000s, however due to the next round of growth of tension in relationship with Russia they lost relevance again.

Under the influence of globalization and changes of the socio-political situation in the world the views of the IEA experts underwent an evolution of the «energy security» concept. As it was noted in the World Energy Outlook 2009, concerns about energy security – defined as the access to an adequate, feasible and reliable supply with energy – arise from time to time, bringing changes to the international energy system and a new understanding of risks and eventual price of disruption of energy supply. Thus, according to IEA, the problem of energy security consists not in lack of energy resources, but in ensuring access to these resources. This results in aggravation of the world competition for the rights and terms and conditions of this access.

And, if in the 70-80s of the 20th century the attention was focused on oil and on risks relating to extreme dependence on its import, currently concerns for energy security extend also on gas, international trade in which constantly grows, as well as on reliability of supply with electric energy. Moreover, it is the question of not only reduction of dependence on a single gas seller (exporter), but also on a single method of its delivery.

There are several reasons of change of approach to the energy security: they include political instability in certain regions of the planet, lack of conventional regulating international legal mechanisms, imperfection of infrastructure and one-sidedness of geography of pipeline routes along with underdeveloped system of overseas transportation of natural gas. And today the problems of national, regional, world energy security become more complex: the competition for access to energy resources becomes tougher, state regulation and control both in the energy markets, and on routes of transportation of energy carriers is reinforced.

It was already mentioned that the awareness of globality of energy security, the understanding of its necessity within the framework of international cooperation is from time to time called into question and is not shared by all politicians.

Especially the USA «succeeded» in this sense in recent years. If at the beginning of the 2000s the USA actively looked for external partners in the field of energy policy (Energy Dialogue Russia – the USA may serve as an example), gradually this activity began to decrease. Violating theses of the Statement of Global Energy Security Principles adopted at the G8 Summit in St. Petersburg in 2006, the USA and their allies as if «forgot» that it is necessary to respect legitimate interests of both importers and exporters

of energy resources³⁵, and declared boycott of Iranian oil, constrain by all available means expansion of oil production in countries with «bad» regimes (Venezuela, Ecuador, Bolivia). Thereby, punishing oil exporters for political and geopolitical reasons, the USA during quite a few years objectively pushed the level of world oil prices up, undermining global energy security³⁶.

Such actions of the USA are based on specific understanding by them of problems of ensuring energy security, and on development of respective technologies. In the USA energy security is traditionally primarily associated with achievement of maximum degree of self-sufficiency in terms of energy resources, enhancement of energy efficiency of economy, development of nonconventional types of energy and increase in strategic oil reserves. These strategic directions practically do not change during the last decades. As the U.S. President Barack Obama noted in the spring of 2010, the essence of the energy policy of the country consists in «transition from the economy operating using fossil energy carriers and foreign oil to such which relies on types of fuel produced within the country, and on environmentally friendly energy» [104]. In implementation of these strategic tasks nonconventional resources of hydrocarbons (shale gas and shale oil) and biofuel production are prioritized [105-107].

Therefore it is quite probable that in the long term the USA not only will even more reduce their activity in searching ways of ensuring global energy security – because for many years they will become an energy sufficient power and a most large exporter of energy technologies – but also will take the path of its undermining. Such conclusions are confirmed by specific actions of the USA in recent years.

Such revision of the concept of global energy security is also conditioned by the abovementioned change in energy philosophy which resulted in cardinal changes of geopolitical situation in the world and transition from the policy of international energy cooperation to the policy of energy self-sufficiency of the main (or many) consuming countries. Thereby, the problem of global energy security which was on the agenda of the G8 Summit in St. Petersburg in 2006 obviously took backseat.

³⁵ The Statement underlines: «Due to the global character of these (*global energy*) problems and growing interdependence between producing countries, transit countries and consuming countries it is necessary to develop partner relations between all concerned parties in order to strengthen global energy security» [108].

³⁶ For more details see [109].

5.3. A situation with energy security in Eurasia

It is natural that all changes happening in the world also affected to the full extent Eurasia. It is here that the center of the world development is shifting, and the main part of the world population is concentrated. Eurasia currently enters a new period of energy development. Accordingly, as the Minister of Energy of the Russian Federation Alexander Novak noted at the conference in Berlin organized by Valdai Discussion Club on April 13, 2015, the question of forming of a new configuration of energy security, a new balance of interests of producers and consumers providing for a fair distribution of risks and stability of long-term investment processes [110] is on the agenda.

However today in various parts of Eurasia the problem of energy security is understood and interpreted differently. And these differences are caused not only by the fact that with respect to energy resources one countries act as their exporters, and others as importers. The nature of understanding of the problem is influenced by a lot of factors, including the fact that in modern conditions the concept of «energy security» significantly extended.

In the western part of Eurasia, in developed countries importing of energy resources, by energy security they mean first of all uninterrupted and steady supplies of energy resources for needs of their economies.

From the point of view of general conceptual approaches the American and the European views on energy security are similar. The American and European documents set an ambitious task of essential reduction of dependence on hydrocarbons and creation in the long run of a hydrocarbons-free economy. Medium-term tasks include expansion of access to hydrocarbons and geography of their supplies; increase in hydrocarbons production and their maximum offer in the market; promotion of energy-saving technologies in the world. The core rationale of the American and European politicians is to reduce dependence upon suppliers of hydrocarbons and to ensure a wide geography of deliveries [87].

The European Union countries traditionally considered substantial dependence on import of energy resources, as well as high oil prices and their fluctuations to be the main threats to the energy security. Accordingly, «predictable and stable [political] regimes [in countries exporting energy resources], steady and clear taxation system», absence of «unfair administrative barriers» were regarded as preconditions of ensuring energy

safety. Measures intended to ensure energy safety also followed from such understanding: to open markets of resource producing countries for investments, to lift any restrictions for export of energy resources, to provide full information about oil reserves, to make the process of management of state revenues of sale of energy resources transparent [68]. At the same time the process of understanding that the energy security problem shall be solved through economic cooperation. Earlier we already quoted José-Manuel Barroso, former president of the European Commission, who told in July, 2006: «Energy security is a global problem which requires global solution» [90]. The same year Daniel Yergin noted: «Real energy security imposes abandoning unrealizable dream of energy independence and reconciling with interdependence» [111].

In general for the last 20 years the main directions of the EU energy safety strategy included development of the internal energy market and enhancement of energy efficiency, increase in national production of renewable types of energy and diversification of deliveries of energy carriers.

However after «the first Russian-Ukrainian gas war» (2006), the EU dependence on supply of Russian energy resources, especially natural gas, began to be considered more and more as the main threat to the energy security. In analysing effects of interruption of supply of the Russian gas to the European countries because of «gas wars» with Ukraine and Belarus, which caused notable damage to the image of Russia as a reliable supplier of energy carriers, EU analysts took the fact that all gas pipelines of the Russian Federation go west, as an axiom [112, page 30]³⁷.

The gas conflict as a result of which the European countries felt their helplessness in terms of energy safety, became a motive for taking a new look at the situation. Termination of supply of gas entail economic and political losses not only for the Russian Federation: such situation, if it repeats, will threaten the image of the governments of EU countries. The population of these countries which got used to certain standards of life demonstrated anti-Russian moods, and induced to look for other ways of ensuring energy safety [112, page 31].

After the crisis and the coup d'état of 2014 in Ukraine and a new round of tension in relations with Russia the thesis about the need to diversify

³⁷ Detailed consideration of reasons of this conflict and other problems in gas relationship between Russia and the EU is not within the terms of reference of this publication. It should be noted only that the share of responsibility for them is borne by both parties. The European energy safety issues and Russia's role therein are considered in more details in [8 and 93].

gas supplies and to decrease the dependence upon Russia began to sound with a new force. However now the question is already about three strategies of diversification: diversifications of import sources of natural gas, diversification of routes of supply of natural gas and diversification of sources of energy resources as such [113]. Developing the thesis about diversification, the European Union put forward an idea of creation of the EU Energy Union meaning that its members (EU countries) will conduct negotiations with energy suppliers in a uniform block [113-116]³⁸.

By the way, the Minister of Energy of the Russian Federation A. Novak called these initiatives of the European Union of creation by consuming countries of an institution of a Single gas purchaser and of approval by the buyers of gas purchase contracts of the European Commission «frankly anti-market» [110].

The development of the process of understanding of the fact that the energy security problem may be solved efficiently only through economic cooperation was greatly influenced by the Energy Dialogue between the Russian Federation and the European Union³⁹ which from the very first days became an important instrument of ensuring energy safety on the European continent at observance of vital interests of both consumers of energy resources (EU countries), and their producers and exporters (Russia) though directly the term «energy security» was not used during joint work at the first stage of the Energy Dialogue [68, 119].

However during the last years the work of the Energy Dialogue proceeded under rather difficult conditions since already by the middle of the first decade of the 2000s duality and inconsistency of approach to Russia became clear in the EU position on ensuring energy security⁴⁰. On the one hand,

³⁸ After the 2005-2007s energy security issues in the EU began more and more reaching the supranational level (till that time the European Commission, the EU Parliament and Council adopted documents which regulated only specific matters of energy supply of member countries). In particular, in 2008 the European Commission prepared «Energy Security and Solidarity Action Plan» [117] which stated not only strategic objectives of the EU in the field of energy industry and ensuring energy security of the community, but also specific objectives and plans in this field.

³⁹ Energy Dialogue started according to the arrangement between the Russian President V.V. Putin, the President of France J. Chirac and the Chairman of the Commission of the European Communities R. Prodi reached at the Russia – EU Summit in Paris in October, 2000. For more details see [93, 118].

⁴⁰ This duality and inconsistency of approach to Russia date back as early as the late nineties of the 20th century. However peaked already at the following stage when charges of «resource nationalism», «energy blackmail», «use of energy resources as a weapon», «political manipulations with export of energy resources», «threat to use the supply of energy resources as a tool of political pressure», etc., etc. reached apogee. For more details see [68].

the European Union criticized Russia for its inability to meet completely growing demand for fuel and energy in Europe, but on the other it strived more and more to limit access of Russian energy carriers to the European market. Moreover, in the last decade, proceeding from its understanding of possibilities to ensure energy security, the EU focused its efforts on the search of alternative external sources of energy resources and diversification of their supply routes. The Russian Federation also took a number of measures to diversify the directions of supply of its energy resources.

In eastern part of Eurasia the situation with energy safety is heterogeneous. So, OECD member countries (in particular, the Republic of Korea and Japan) mainly interpret energy safety issues and measures to provide it in the same way as the EU and the USA. In particular, the understanding that overconsumption of energy-intensive material benefits resulting in unreasonable increase in demand for energy resources is a global threat to the energy security also grows there. However in Korea and Japan not renewable energy sources, but gas hydrates are considered to be the main energy resource that may guarantee their energy self-sufficiency [26].

Developing Asian countries – consumers of energy resources, especially the poorest, need access to relatively cheap energy, a confidence that oil and gas production in the world will grow, and they will be always able to purchase them in required quantities. Moreover, for those of them which entered the phase of catching-up development, first of all for China and India, shortage of energy resources may cross out the perspective of economic growth and achievement of at least minimum level of welfare for their population. Therefore they tend to promptly adapt to a new dependence on world energy markets that testifies to their departure from former aspiration to self-reliance. The awareness of the fact that low energy efficiency of their economies is a global threat to the energy security also grows. Accordingly, such countries see the solution of the energy safety problem, first of all, in international energy cooperation which opens for them not only access to energy resources, but also to technologies which make it possible to use local nonconventional energy sources.

Countries exporting energy resources, mainly the Middle East countries which need stable and predictable energy markets, stable and/or predictable prices for energy resources enabling their efficient export, are interested in growth of oil and gas production and high oil and gas prices.

However the abovementioned duality of positions of the EU and other OECD countries with respect to energy security shows up also in their approach to the energy policy of oil and gas exporting countries. So, while in words both the EU, and the IEA member countries recognise interdependence of producers and consumers of energy resources, and oppose to the use of energy as a tool political blackmail, they subject to obstruction everything that is connected with so-called «gas OPEC»⁴¹. For example, on the eve of the conference of the Gas Exporting Countries Forum (GECF) at the level of ministers of 14 GECF member countries held in Doha, capital of Qatar, on April 9-10, 2007, the next wave of condemnation of energy policy of international exporters of energy resources rose in the world [119].

As for *Russia*, our country, recognizing that energy security is the most important component of the energy policy and national security of leading states of the world, in general shares commonly accepted understanding of energy security as a reliable and uninterrupted supply of consumers with fuel and energy in necessary amounts and of required quality at economically reasonable prices [91, 92]. However in recent years the «energy security» concept was somewhat refined. So, in the Energy Strategy of Russia for the period till 2030 (Energy Strategy-2030) adopted in November, 2009, energy security was defined as «a state of safety of the country, its citizens, society, state structures, and economy against threats to reliable supply with fuel and energy». While just several years ago, in the Energy Strategy for the period till 2020 energy security meant «... complete and reliable provision of population and national economy with energy resources at affordable – and at the same time stimulating energy saving – prices, mitigation of risks and prevention of development of crisis situations in the energy supply of the country» [120, 121].

⁴¹ The issue of consolidation of gas exporting countries for protection of their common economic interests in their relations with importing countries has been discussed since the beginning of the 90s of the 20th century. The idea of creation of «gas OPEC» was advanced in 1999 at the gas forum in Paris, but was taken negatively by the main gas importing countries, and especially by the large European exporter - Norway. In 2000 similar initiative was put forward by Iran which suggested creating a regional scale «gas OPEC» with participation of Caspian region countries. But this idea was not supported by from Russia and other Caspian states. In 2002 at the CIS summit in Alma-Ata it was declared about intention of Russia, Kazakhstan, Turkmenistan and Uzbekistan to form the Eurasian Gas Alliance within the framework of which these countries were going to coordinate export policy and to set up joint management and operation of the Central Asia - Center gas pipeline system. However these intentions were never implemented because of complicated relations between Turkmenistan and Uzbekistan. For more details see, e.g. [93].

At the same time in Russia we think that fair distribution of risks between all participants of the energy chain, balance of interests of not only producers and consumers of energy resources, but also transit countries is one of key elements of the energy safety. Such balance of interests is ensured by the energy safety model based on principles of interdependence and interpenetration. This model implemented through mutual exchange of assets proved its efficiency in our relationship with European – especially German – partners in gas industry with which Russia has been connected by strategic cooperation for many decades.

Long-term goal of the energy policy of Russia is the observance of balance with all main geopolitical centers of force: Europe, China and USA, as well as development of cooperation with them. Such principle of the energy policy of Russia reflects its role as a central Eurasian power influencing, in no small measure, sustainable development of the humankind. Russia sees its task not in opposition of cooperation with Europe to cooperation with Asia, but in manifestation of its special role on the continent determined by its geographical location, its energy potential, and historically developed mentality of its people.

5.4. Partnership of Russia and China as a basis of energy safety in Eurasia

Under conditions of global turbulence and varying challenges and threats in the world the importance of the Russian-Chinese strategic partnership especially increases. Both states, as noted Russian President V.V. Putin, experience a «deficiency of safety» against the background of aggravation of «system imbalances in the world economy, in finance, in trade ... washing out of traditional moral and cultural values» [122].

Nowadays a NEW (*deideologized*, according to the statements of officials of both countries) partnership is being built between Russia and China, when there is neither leader nor subordinate (so-called «senior» and «younger» brother). When non-interference in each other's internal affairs is the basic principle, and a union of two states is not directed against third countries; a partnership wherein equally state structures, business (private sector), and civil society institutions [123, 124] participate.

This partnership – as it is understood in Russia and as, in our opinion, it is perceived by our Chinese friends – is based on coincidence of vital interests of our countries, understanding that the era of hegemonism of certain countries and their unions became beyond retrieve a thing of the past, and world development requires new thinking [125]. Of course, we realise that formation of such new partnership is a long, difficult, and contradictory process. But this is a beginning of a new geopolitics aimed at strengthening of peace and cooperation both in Eurasia, and around the world (Fig. 22).

Strategic partnership is the best form of relations of Russia and China. It absorbed experience and historical lessons, is closest to their present level and state, as well as fully complies with internal policy of two countries. The developed format is fully accepted and supported by elite and people of Russia and China.

The becoming of this new partnership has to play a crucial role in implementations of three largest projects on the continent – the Eurasian Economic Union, the Shanghai Cooperation Organization and the Chinese overland project «Silk Road Economic Belt» (or «A New Silk Belt»)⁴².



Source: [21]

Fig. 22. Russia and China: two ideas, one purpose

⁴² In more detail about Chinese strategic initiative Silk Road Economic Belt see section 7.2, as well as, e.g., [6, 12].

This China's strategic initiative means, in fact, a new vector of economic development of regions located between China and Europe, partly along the historical route of the Great Silk Road (Fig. 23 and 24).

The new way (one way, but several routes) will stretch through many countries of the Eurasian continent. Its length will be 7 to 10 thousand km. To some extent this «belt» will cover the territory where 3 billion people live, connecting Asian, Pacific and West European economic spaces.

The main goal of the «Silk Road Economic Belt», according to Beijing, is the creation of a new model of regional cooperation. Traditional model of regional cooperation considers in the first instance conclusion of mutually advantageous trade and investment agreements and establishment of a uniform customs policy, and then creation of interstate institutions.

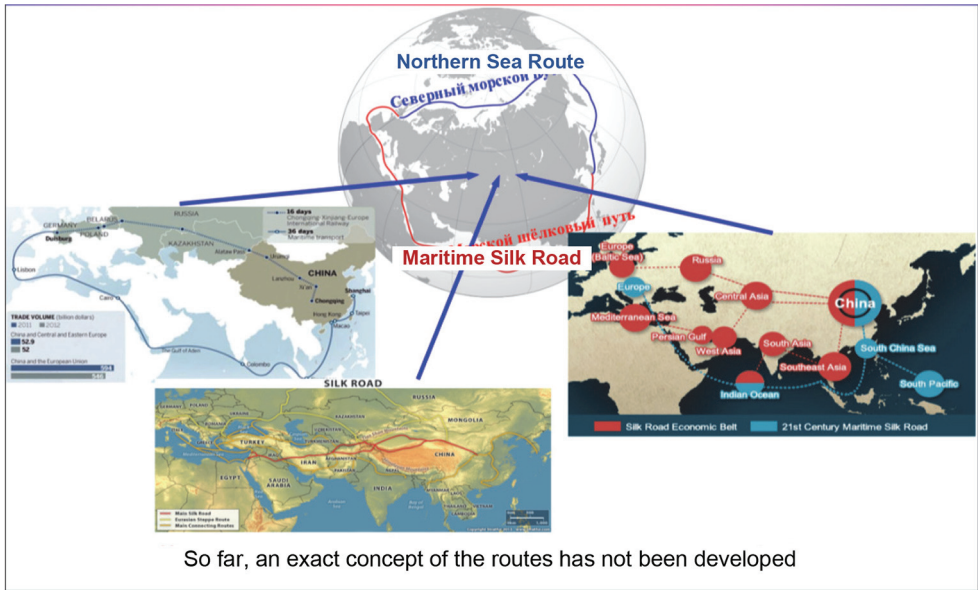
The Silk Road Economic Belt (SREB) project differs from this model. Its main goal is cooperation in the areas of trade, transport and investments (Fig. 25).

Subsequent creation of a customs union is not envisaged. The «Economic Belt» is not a project of integration cooperation. It does not destroy the existing mechanisms of regional communications. However, as Russian experts note, the «Silk Road Economic Belt» is not simply a transit and transport project. In fact, it is a comprehensive plan of economic development of a number of countries including numerous projects of development of infrastructure, industry, trade and services sector which will promote creation of a stable and safe environment not only of western regions of China, but also of the whole center of Eurasia [6]. And from the point of view of safety this project has to become an efficient response to some modern challenges and threats, by undermining their social base and developing an appropriate infrastructure⁴³.

At this stage the exact concept of the routes within the space (SREB) has not been developed yet.

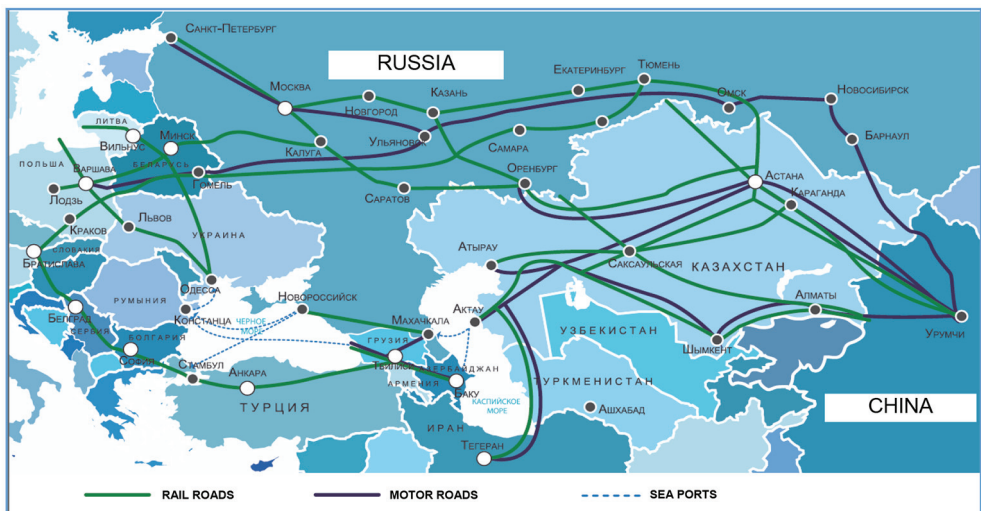
So far these three projects (EAEU, SCO and SREB) have been developed in parallel, independently from each other, creating even a certain competition in the transport, energy, trade and economic spheres. But already today the scenario is discernible of creation of an interaction structure in which the SCO would play a central (binding) role of an «Eurasian bridge» between the «New Silk Road» and the Eurasian Economic Union [6]. By the way, on July 10, 2016 India and Pakistan became members of the SCO, and now this

⁴³ For more details see [12].



Source: [21]

Fig. 23. Space of the «Silk Road Economic Belt»



Source: [12]

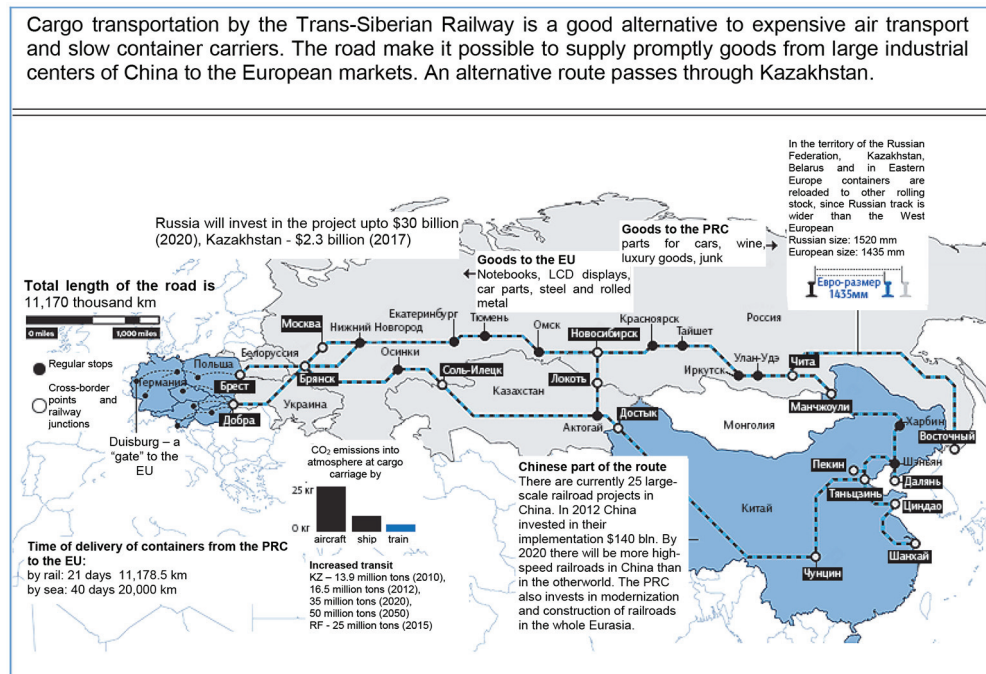
Fig. 24. Main perspective directions of the New Silk Road Economic Belt

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organization includes most great powers of Asia⁴⁴. The SCO can provide the «Big Asia» with a mechanism for consultations and coordination of policy, joint economic development, financial support and cooperation in the field of safety.

Of course, there are a lot of unresolved questions here, many things are not clear. Moreover, we understand perfectly that Russian and Chinese vision of development of Eurasia in some areas does not coincide, that «the Eurasian compromise» of two countries has to be built based on consideration of mutual interests and reciprocal concessions in these spheres.

At the same time it should be noted that according to some experts the turn of the Russian foreign policy towards the East, against the background of a sharp deterioration of relations with the European Union and the



Source: [126]

Fig. 25. The main goal of SREB is cooperation in the areas of trade, transport and investments

⁴⁴ As of the end of 2016 member countries of the SCO were: India, Kazakhstan, China, Kyrgyzstan, Pakistan, Russia, Tajikistan and Uzbekistan. Four countries - Afghanistan, Belarus, Iran and Mongolia - had an observer status, and six countries - Azerbaijan, Armenia, Cambodia, Nepal, Turkey and Sri Lanka - were dialogue partners [127].

USA, does not meet reciprocity yet on the part of the key – according to the Kremlin – partner, China. So, in the concept of foreign policy in Asia prepared and published by the State Council of the People's Republic of China at the beginning of January, 2017 («China Policy of Strategic Cooperation in the Asia-Pacific Region») Beijing again placed the relations with the USA on the top of the list of diplomatic and strategic priorities [128-130]. Washington managed to obtain the status of the most important partner even in spite of the fact that it opposes sharply Beijing claims for disputed territories in the South China Sea and installed the THAAD antimissile system in South Korea. And the new administration of the White House does not hide its intentions to toughen policy in this direction. Nevertheless, the State Council document stresses that the relations with the USA «remained stable since 2015 and even have been developing to a certain extent».

The relations with Russia in this document are ranked second. Russia is called «the largest neighbour and strategic partner». The third and the fourth places in the list of regional players are allocated for India and Japan.

The Shanghai Cooperation Organization which actively promoted by Moscow as a platform for extending Russia's influence on the Asian region, is placed second to the last in terms of importance among regional organizations [128-130].

Strategic partnership of Russia and China will give an additional impulse to the Russian-Chinese energy cooperation, contributing to energy security of both countries and Eurasia in general where the issue of formation of a new configuration of energy security, a new balance of interests of producers and consumers providing for a fair distribution of risks and stability of long-term investment processes [110] is on the agenda.

The principle of reasonable sufficiency of diversification of sources of energy supply and markets of energy resources follows from the understanding of such configuration of energy safety especially as a dangerous tendency of politicization of energy markets for the purpose of their use as geopolitics tool gains steam. The beautiful – in the theory – principle of diversification of sources and routes of supply of energy carriers which is a cornerstone of many energy strategies, in real life provokes strengthening of geopolitical rivalry between the countries, scattering of funds and loss of time necessary for the solution of essential problems of energy supply and fight against energy shortage. Diversification of deliveries is certainly necessary. But

new sources shall supplement the existing ones instead of replacing them without justified reasons. Besides, it is necessary to understand that such diversification requires additional investments which will pay off through an increase in prices for final consumers.

Successful Russian-Chinese cooperation could become an example for other countries, first of all countries of the North-East Asia, an example of how, by diversifying markets, and, accordingly, supply sources, it is possible to concentrate efforts on several large-scale projects providing for the achievement of objectives in view. Joint investments into energy projects in the territory of Russia and long-term contracts for ensuring reliable and stable supply of hydrocarbons from the Russian Federation to the North-East Asia countries may become a real tool for increasing energy security both of this region, and the whole Eurasia for a long term.

5.5. New initiatives

The current external situation of Russia, including economic sanctions, does not contribute to the advancement by our country of any initiatives aimed at providing global energy security or energy security of such a region as Eurasia [20].

All the more so as with a change of the situation in the world energy industry the views of leading western countries on the place of Russia within the global energy security system also changed.

Traditionally, from positions of developed countries-importers of energy resources the place of our country within this system was determined by its capability to provide growing supplies of energy carriers on conditions acceptable for these countries, and at prices profitable to them. So, the EU – the main importer of the Russian energy resources – at the beginning of the 2000s, especially in anticipation of the G8 Summit in St. Petersburg, continued to insist on increasing oil and gas supply from Russia. In particular, to start as soon as possible the development of the Shtokman gas field to increase hydrocarbons offer in the market and to reduce thereby – at least a little – the prices for them [131].

The main IEA's requirements to Russia included suggestions to increase internal gas prices in the country, to strengthen competition between gas manufacturers and to modernize the gas transport system in order to reduce

own fuel consumption and to increase its offer for export to Europe, as well as to increase efficiency of use of associated petroleum gas⁴⁵.

In the fall of 2006 the European Commissioner for energy Andris Piebalgs openly criticized Energy Strategy of the Russian Federation. According to him, «Russia is not capable of satisfying the growth of energy consumption in Europe» [133]. Marco Franco, Chief of the European Commission Representative Office in the Russian Federation also expressed concern that Russia would not be able to ensure at a due level deliveries of energy carriers in the future. In his opinion, forecasts were saying that production of energy carriers in Russia would be insufficient to meet at the same time internal needs, and export requirements [134].

Almost until the middle of the first decade of the 21st century, the USA also actively strived to get access to the Russian energy resources. The joint statement of the Presidents of Russia and the USA after negotiations in London in April, 2009 became a sign-off in this direction. «We also intend to develop cooperation in implementation of the Global Energy Safety Principles adopted at the G8 Summit in St. Petersburg in 2006, in particular in the field of increase of energy efficiency and development of technologies of environmentally friendly energy», the statement said [135].

However already by the end of the first decade of the 21st century dependence on supply of the Russian energy resources, especially natural gas, began more and more to be considered as the main threat to the EU energy security of. And «shale revolution» in the USA reduced almost to zero the need of this country for Russian energy resources.

Nevertheless, we find it possible to offer for discussion to our foreign partners, in particular, from the North-East Asia countries, such issues as the development of framework international agreements which would regulate the conclusion of energy carriers supply contracts taking into account particular characteristics of specific countries. The guarantee of free transit of energy carriers, in particular gas, on pipeline systems laid through the territories of signatory countries shall be one of basic principles of such documents. Besides, it makes sense to formalise at the contractual level the transparency of functioning of the energy sector at strict observance of trade secrets. It is necessary to establish uniform energy carriers pricing

⁴⁵ A bit later these requirements were formulated in the form of a special action plan in the gas sphere handed over to the government of Russia during the St. Petersburg G8 Summit and stated by Claude Mandil, the Executive Director of the IEA, on July 18, 2006 at presentation of the IEA's report «Optimizing the Russian Natural Gas» [132].

rules and the principle of state regulation of these rates with an exhaustive list of underlying factors.

Perhaps, the idea of creation of the Eurasian Energy Agency also deserves attention. Certainly, not in counterbalance, but rather in addition to already existing International Energy Agency (IEA), but with an agenda specific to this region.

In our opinion, the aspiration of Ministers of Energy of some Asia-Pacific countries to consider ecological stability issues within the energy security ensuring task should be given due support. At the beginning of September, 2014 a meeting of the Ministers of Energy of 21 Asia-Pacific countries on energy safety issues (2014 APEC Energy Ministerial Meeting) was held in Beijing. Ensuring sustained economic growth with simultaneous reduction of the environmental load was the principal theme of the agenda. Asia-Pacific accounts for 55% of world energy production and 60% of its consumption. At a meeting it was noted that by 2030 fossil energy carriers will make 80% of total energy consumption of the region, with ever growing share of LNG and shale gas. Wu Xinxiong, Administrator of China's National Energy Administration presiding at the meeting declared: «We have to reach a balance between economic growth, energy security and environment protection» [136]. This keynote (energy safety, energy cooperation, energy efficiency, sustainable development, and environmentally friendly energy) also runs like a scarlet thread through the final document of the meeting entitled «The Beijing declaration based on results of the 11th meeting of the Ministers of Energy of the APEC countries» [137]. It should be noted that ecological stability is even more often considered in Asia-Pacific as a key component of energy security [138].

In our opinion, even partial implementation of such initiatives will make it possible to take a new, next step to ensuring energy security on the entire Eurasian space.

As we already noted above, experience of resolution of energy security issues in the EU, in the USA, and in other countries and regions of the world testifies that energy security is a global problem that cannot be solved not only on a one-sided, but even on a bilateral basis. And as the humankind in the 21st century lives in a globally interdependent world, the energy security system have to ensure reliability of supply of energy resources in common interests of the world economy, to the benefit of all countries – both consumers, and producers of energy resources. And this system has to be transparent, be based on international law and responsible policy in respect of demand and supply of energy resources.

6. RUSSIA ON THE NEW MAP OF THE WORLD ENERGY SPACE

At the beginning of section 3 we already noted that for the last 5-7 years *a new energy picture* of the world has developed. But the process of its formation is not completed yet. It is, actually, in full bloom that allows us to speak about the process of formation *of a new map* of the world energy space in which virtually all main energy actors participate.

It is natural that Russia does not stay on the sidelines, away from the solution of long-term problems of the world energy industry and also participates in this process. Strategic objectives of the energy policy of the Russian Federation stipulate not only maintaining of its positions as a largest supplier of energy carriers to the world market. The task is to qualitatively change the nature of Russia's presence in this market through diversification of commodity structure and energy resources export directions, as well as to expand the presence of Russian energy companies abroad. Initial versions of the draft Energy Strategy of Russia for the period till 2035 (hereinafter referred to as Energy Strategy-2035) even contained a task to provide for the transition of national economy from the development based on export of raw materials to the innovation-based development [139]⁴⁶.

The main task for the Russian energy industry for a long-term outlook is still to retain leading positions in the world energy markets, to satisfy the needs of the home market for fuel and energy resources, and to supply them to foreign partners – both present and future.

⁴⁶ So, presenting the draft Energy Strategy-2035 on March 11, 2014 at the first meeting of the Public Council at the Ministry of Energy of the Russian Federation, minister A.V. Novak, speaking about its fundamental differences from ES-2030, emphasized that **the energy policy is reoriented from a resource-and-raw materials based option to the resource-and-innovation based development** (*bold type used by us - Authors*). This make it possible to use as a cornerstone qualitative changes of the energy consumption structure, increase in quality of energy services, technology-based energy saving and modernization, profound electrification, development of oil and gas chemistry and other new industries rather than quantitative increase in volume indicators [140]. For the last time resource-and-innovation based development is mentioned in the draft Energy Strategy-2035 revision prepared by the IES and the Institute for Energy Studies of the Russian Academy of Sciences, and submitted to the Ministry of Energy of the Russian Federation in August, 2015 [141]. However starting from the draft Energy Strategy-2035 version published on the website by the Ministry of Energy of the Russian Federation on September 17, 2015 resource-and-innovation based development was never more mentioned in the Energy Strategy-2035. Unfortunately, without any explanations. For more details see [142].

Taking into account the forming world trends, Russia develops production of liquefied natural gas (LNG), stimulates development of problematic and offshore oil reserves, including the Arctic shelf, develops infrastructure for the export of all types of energy resources – oil, gas, coal and electric energy. However the fuel and energy complex of Russia may achieve its strategic objectives only if it follows an innovation-based development path, including an active promotion of innovations to a qualitatively higher level in all branches of the energy industry and an integrated development of own competences.

Forward-looking technology directions capable of changing the shape of the Russian energy industry include:

- hydrogen energy,
- small-size distributed generation with the use of RES,
- photo-electric converters, network storages,
- smart energy technologies,
- equipment based on superconductivity [143].

The implementation of the main objectives of the Energy Strategy of Russia based on the latest technological potential will directly affect the place of the country on the future map of the world energy space.

Against the backdrop of geopolitical tension between Russia and the West, one cannot dismiss the issue of western sanctions and trade restrictions against Russia. Their negative effect should be taken into account at development of the energy policy of the country. The draft Energy Strategy-2035 shall also contain answers to new geopolitical challenges in the field of energy industry. In our opinion, the thesis that the energy is, first of all, a social sphere and only in the second place – socio-political one, has to become a starting point when at development of the energy strategy. Therefore factors of social and political (including geopolitical) development which dictate requirements to the energy industry, should be regarded as demands imposed on the energy industry on the part of the society.

As it was emphasised above, the central task set by the draft Energy Strategy-2035 is the transition from the resource-and-raw materials based to the resource-and-innovation based development of the fuel and energy complex. The target of the energy strategy of Russia for the period till 2035 is the creation of an innovative and efficient energy sector of the country for a strong growth of the national economy, improvement of quality of life of population and strengthening of its external economic positions. And

energy security, energy and cost efficiency, and sustainable development of the energy industry have to become its main reference points.

The major geopolitical challenge for the Russian energy industry is a drastic toughening of conditions and competition in the foreign energy markets. The Russian energy industry has to withstand a serious competitive struggle to retain and increase its share both in traditional, and in new energy markets.

6.1. Foreign policy component of a new map of the energy space

Russia borders and actively interacts with the following geopolitical spaces:

1. Post-Soviet countries
2. Euro-Atlantic region (Europe and USA)
3. Asia-Pacific Region (APR)
4. Middle East and North Africa
5. Arctic field

The foreign policy of the Russian Federation is based on the following main postulates formulated, in particular, in the Concept of Foreign Policy of the Russian Federation [144]⁴⁷:

- The modern world passes through a period of deep changes, the essence of which consists in shaping of a polycentric international system. The structure of international relations continues to become more complicated. As a result of globalization process, new centers of economic and political influence appear. The world power and development potential is redistributed and shifted to the Asia-Pacific Region. Possibilities of the historical West to dominate in the world economy and policy are reduced. The variety of cultures and civilizations in the world, plurality of models of development of the countries become clearly apparent.
- The contradictions connected with irregularity of the world development, deepening of the gap between welfare level of different countries, intensification of fight for resources, access to sales markets, transport arteries control become aggravated. The competition not only covers human, scientific and technological potentials, but

⁴⁷ Till December, 2016 was effective in the version of February 12, 2013. On November 30, 2016 President V.V. Putin of the Russian Federation approved a new version of the document [144, 145].

assumes more and an all-civilization character, a form of rivalry of value orientations. Under these conditions any attempt of imposing to other countries own scale of values are fraught with growth of xenophobia, intolerance and a conflictness in international affairs and finally may result in chaos and uncontrollability in international relations.

- Priority tasks include prevention of intercivilization breaks, formation of a partnership between cultures, religions and civilizations, which is meant to provide for a harmonious development of the humankind. The striving of the western states to retain their positions, in particular by imposing their point of view on universal processes and carrying out a policy of containment of alternative centers of force, leads to increased instability in international relations, to strengthening of turbulence at the global and regional levels. The fight for domination in forming key principles of organization of the future international system becomes the main trend of the current world development stage.
- Along with military power, such important factors of influence of countries on international policy as economic, legal, technological, informational move to the forefront. The ambition to use respective opportunities for implementation of geopolitical interests causes damage to the search of ways of dispute settlement and solution of existing international problems by peaceful means on the basis of the rules of international law.
- Under conditions of accumulation of elements of crisis phenomena, a new reality emerges in the world economy characterised by a general slowdown of growth rates, volatility of financial and commodity markets, fragmentation of the global economic space into regional structures with competing tariff and non-tariff restrictions. On this background, regional integration on the basis of rules and regulations of the World Trade Organization (WTO), strengthening of the role of regional reserve currencies are factors of enhancement of competitiveness, safety and financial and economic stability.
- Qualitative transformation proceeds in the field of energy industry, which is connected first of all with implementation of new technologies of production of problematic hydrocarbon reserves, expansion of use of renewable energy sources. At the same time in the situation when, to ensure their energy security, some countries seek to diversify their presence in the world markets, we witness toughening

of unreasonable restrictions and introduction of other discriminatory measures in this sphere.

- The outlined change of the technology pattern in various branches of economy may bring about further aggravation of economic rivalry, accelerate the redistribution of forces on the international scene.
- Global challenges and threats require an adequate comprehensive answer from the international community, consolidation of its efforts at a coordinating role of the UN and taking into account objective interrelation of the issues of human rights protection, safety and sustainable development.

In this context priorities of the Russian Federation in the solution of global problems are [144, 145]:

- forming of a fair and stable world order;
- supremacy of law in international relations;
- strengthening of the international security;
- international economic and ecological cooperation;
- international humanitarian cooperation and human rights;
- information maintenance of foreign policy activity.

Thus, the world is at the stage of transition to a new historical era. A polycentric architecture of international relations is being formed. This is an objective process reflecting cultural and civilizational variety of the modern world, emergence and strengthening of new centers of power and influence. Russia does not oppose Eurasian and other integration processes, aiming at their harmonization, at building bridges between Europe and the Asia-Pacific Region. So, for example, a task has been set to develop the infrastructure of cooperation on the Central Asian space, in particular through the interface of the Eurasian Economic Union (EAEU) and the Chinese project «Silk Road Economic Belt» (SREB) (Fig. 22). The foundation for the implementation of the initiative of President V.V. Putin of Russia to form economic partnership with participation of member state of the EAEU, SCO and ASEAN is being laid. And after all it is almost a third part of the world economy! Such a partnership could become a generator of safe development on the Eurasian continent in general (Fig. 26).



Fig. 26. Three largest Eurasian projects

6.2. The EAEU and the Eurasian economic space

As it was already noted, the Eurasian Economic Union (EAEU, the agreement on creation of which came into force on January 1, 2015⁴⁸ (Fig. 27) may become an efficient link between Europe and Asia-Pacific countries.

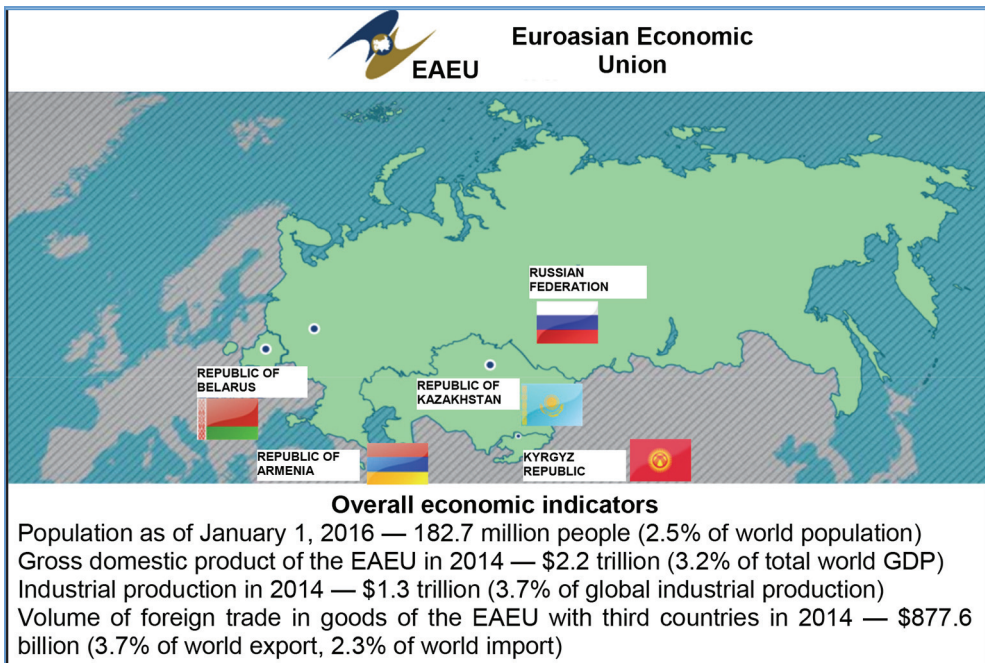
Taking into account overall indicators, the EAEU is currently the second largest integration association in the world after the European Union. The capacity of the EAEU countries in the energy sphere is also considerable. The EAEU accounts for 20% of the world natural gas reserves and production and 25% of its world export; 20% of world coal reserves and 6% of its world production; 7% of world oil reserves and 15% of its production and export; 21% of world uranium reserves and 43% of its world production; 5% of world production of electric energy. The share of the energy industry in GDP of

⁴⁸ The Eurasian Economic Union is an international integration economic association, the member states of which are Russia, Belarus, Kazakhstan, Armenia and Kyrgyzstan. The Union began its work on January 1, 2015, substituting for the Eurasian Economic Community (the EurAsEC, existed in 2000-2014). The present-day EAEU is formed on the basis on the Customs Union and the Common Economic Space of Russia, Belarus and Kazakhstan (till 2015 operated within EurAsEC). The purposes of creation of a new EAEU included ensuring freedom of movement of goods, services, capital and labour force, as well as carrying out coordinated or uniform policy in the economy branches.

EAEU countries is 17%. This potential may serve as a solid basis for the integration process.

Based on the universal integration principles, the EAEU has is meant not only to use as much as possible mutually advantageous economic ties over the realm of the Commonwealth of Independent States (CIS), but also to become a binding model of the association determining the future of the Commonwealth countries.

The EAEU openness is not limited to the format of the East Eurasian civilization space. The union is also attractive for countries of other regions (for example, the EAEU already signed a free trade zone agreement with Vietnam, there are respective consultations with some other countries). Thus, the EAEU may become one of steps on the long way of forming of the «partnership of civilizations». As a result, the energy integration will become an indivisible element of the future Uniform Energy Space of member countries of the association.



Source: [146]

Fig. 27. The Eurasian Economic Union – the main indicators

The Institute of Energy Strategy (Russia, Moscow) together with the Kazakhstan Institute of economic researches in Astana developed a conceptual draft of *the Eurasian Energy Doctrine*. This draft was prepared on the basis and in furtherance of provisions of the Declaration of the Eurasian Economic Integration signed by Presidents of the Russian Federation, the Republic of Belarus and the Republic of Kazakhstan on November 18, 2011.

It takes into account both interstate agreements, and national strategic documents of the countries founders of the EAEU (Belarus, Kazakhstan and Russia) determining specific terms and conditions and the organizational and legal framework of the integration.

The purpose of the Doctrine is to ensure sustainable energy development of the member countries of the forming Eurasian Economic Space (EurAsES). From the ideological and philosophical point of view the Doctrine is based on idea of a new role of the energy industry in the modern world as a driving force and of joint responsibility within the «multiroom» Eurasian House – Είκος, where the economy is a system of management, and ecology – a factor of stability and harmony. The Doctrine takes into consideration the existing system of relationships of the EurAsES member countries in the field of energy industry, as well as new challenges conditioned by geopolitical and macroeconomic factors [147].

Such new global challenges include:

- superposition at the end of the 2000s – beginning of the 2010s of crisis trends in various spheres of social life, i.e. economic, ecological and energy crises;
- the need of transition to a new development model after exhaustion of the potential of the previous one;
- formation of a new energy pattern in the leading countries of the world, which is a source of both new opportunities, and new risks for energy markets: there is a gradual shift from markets of energy resources to the market of energy services and technologies;
- transition from the «resource globalism» to the combination of technological globalization and regional energy self-reliance.

But the EurAsES member countries face, in addition to universal, special challenges:

- insufficient competitiveness of economy, high dependence on the energy sector, as well as on import;
- need of transition from the resource-and-raw materials based to the resource-and-innovation based development model.

Transition from the market of energy carriers to the market of technologies causes a slowdown of the global economic integration, reduces growth rates of the world economy, including the energy industry, but at the same time promotes transition from «resource globalism» to the combination of technological globalization and regional energy self-reliance.

Thanks to the political will of the management of the EurAsES member countries, a considerable progress in the building of the integration relations in the energy industry has been reached. However general technical, technological, economical and integration problems such as the aging of infrastructure and business assets, insufficiently high level of energy efficiency, difficulty with creation and implementation of modern types of equipment and technologies, insufficiently favorable investment climate, etc. remain unresolved. The extent of penetration of companies of the EurAsES member countries in the world energy market still do not correspond to their infrastructure and resource potential.

The main areas of the Eurasian energy integration include, in particular:

- optimization of infrastructure. It is about creation of infrastructure conditions for the development of local business structures and economic centers; creation of a single Unified Dispatching Directorate system, common electric energy and power wholesale market, coordination of development of the energy transport infrastructure.
- joint innovation projects. There are two priorities here:
 - transfer of energy technologies within the EurAsES;
 - carrying out uniform environmental policy and development of RES;
- foreign energy policy. Its major task is the approval of foreign economic activity, including creation of a mutual consultations system and an investments coordination council.

6.3. Relationship of Russia with the main actors on the world map

Russia's relationship with *the Middle East and North Africa countries* is one of the main directions of its external energy policy. In particular, as it was noted in the mentioned Concept of Foreign Policy of the Russian Federation, Russia will make a powerful contribution to the stabilization of the situation in this region, will continue to develop bilateral relations with the countries of the region. The Middle East not only dominates in the world production and export of hydrocarbons, but also takes the central place at the intersection of trade ways between Europe, Asia and Africa. At the same time the relations between the countries of the region are characterized by sharp conflicts. All these factors make this region in the foreseeable future one of key nodes of the world geopolitics aggravated in particular by intercivilization contradictions.

Islam plays today increasingly important civilization role in the Middle East and North Africa, as well as in the world in general. But Islam is not only a religion, it is also a protest ideology, a global alternative to the existing world order. Islam is more than religion. It is a way of life. After the collapse of the USSR the Muslim civilization in fact offered its option of globalization on the basis of consolidation of marginal social groups under the green flag of Islam. As Francis Fukuyama noted, in the modern world, only Islam offers theocratic state as a political alternative to both liberalism, and communism [148].

A special challenge for the world community in this region consists in the following: it is necessary to search adequate methods of fight against extremist moods which assert themselves more and more in the public opinion of a considerable part of Islamic world. So far, there is no cause for hope for eradication of such moods in the nearest future by economic methods or by means of a dialogue and manifestation of tolerance. Nevertheless, searches of answers to this – in fact civilizational – challenge should not stop or at least be suspended. They have a long-term, continued importance for formation and development of the partnership of civilizations and cannot be – in principle – replaced by military actions of the world community or particular countries aimed at solution of specific strategic and tactical objectives.

Forming of a new world order and steady controllability of the world development needs a leadership of the leading countries of the world.

It has to be representative not only in geographical, but also in civilizational terms. In particular, such formats as the Shanghai Cooperation Organization (SCO), BRICS (Brazil, Russia, India, China, the Republic of South Africa) or G20 meet these requirements.

SCO is one of mechanisms capable to make a stabilizing effect on international relations, to promote unifying trends based on international law and the central role of the UN. This is an association of countries (*the SCO structure is shown in section 5.4*), which cooperate closely and fruitfully, respecting common and national interests for the purpose of forming democratic and fair world order. Despite some discrepancies of political and economic interests of some member countries, first of all Russia and China, during 15 years of its existence the SCO managed to become a solid, full-fledged and very authoritative international association, achieved respect and recognition not only on in Eurasia, but also in the whole world. The Organization Development Strategy adopted at the Ufa SCO Summit (2015), relying on fundamental provisions of the SCO Charter and of the Agreement on Long-Term Neighbourliness, Friendship and Cooperation of Member Countries, determined new strategic milestones taking into account the forecasts of global and regional development for the next ten years. In the Strategy clearly states that member countries will take measures aimed at extending trade and economic cooperation within the SCO: development of production capacities, integration into world economy, practical measures in implementation of specific economic and investment projects within the SCO; work on creation of the SCO Bank and the SCO Development Fund (Special Account), measures for implementation of transit capacity of the SCO, interaction in the field of modernization of infrastructure and logistics will be continued. Besides, the SCO will give priority to the development and implementation of the plan of scientific and technical partnership within the SCO [127].

At the same time the course for the development, expansion and institutional strengthening of the SCO has not become a priority for the Russian foreign policy yet. Nevertheless, standing institutions promoting cooperation in the field of safety, coordination of economic, financial and information policy, technology alliances, logistic ties, etc. may be created within this organization. In this context the SCO, as well as other Eurasian structures, has to be most open for interaction not only with ASEAN or BRICS countries, but also with the Western structures, first of all with the EU [149].

Despite an active work for the creation and development of **BRICS**, the potential of specific cooperation within this organization is limited. It is reduced to coordination in some areas of foreign policy; to the issues of education and human communications. BRICS also may play some role in forming of technology alliances. And as a political club strengthening the potential of its members, it will be probably able to play further balancing and stabilizing part in the world policy.

Considering that within the BRICS format a lot of economic contradictions at bilateral level – relating to the distinctions in the long-term economic growth strategies, and in some cases, with perdurance of protectionist policy in foreign trade remain, so called «hybrid approach» is more probable form of development of integration trends within this format. We mean creation of bilateral free trade areas at simultaneous deepening of commercial and investment ties at the multilateral level.

China can play the central role in implementations of integration trends in BRICS. This country pursues a multivector external economic policy and actively expands the network of bilateral free trade agreements. Russia, India and the Republic of South Africa may have a lower integration motivation. Russia may be interested in signing a free trade agreement between the EAEU and India. A higher probability of conclusion of bilateral free-trade agreements exists in formats China-Brazil, Brazil-India and Russia-India. Real prerequisites of forming of a uniform transregional free trade area within BRICS format can arise by the 2020s, and that is on condition of a continued trend for gradual reduction of customs duties rates and an advancing growth of mutual trade between Brazil, Russia, India and the Republic of South Africa. In general, the efficiency of multilateral integration processes between the BRICS countries will depend on previous development of technology cooperation and expansion of investment ties between them [150].

Maintaining balance in relations with all main geopolitical centers of power: Europe, USA and China is an invariable and long-term goal of Russia.

It seems, that in relations with **Europe** it is necessary to recognize that, it is not a model and far much less a threat for Russia. Europe is close to Russia in terms of culture; it is an old and steady partner in economic and human interaction. Historically, Europe is the most important source of the Russian civilization and culture. For most Russian citizens it is also a source identity. But the ties are not only civilizational. We are connected also by common

global challenges: in addition to terrorism, armed conflicts, proliferation of mass destruction weapons, organized crime, natural cataclysms, threats to health, environmental protection – also the gaining a foothold in a new world configuration. And if Europe cares of its role in the world in the middle of the 21st century, of preserving its cultural space, objectively it has on the continent the only one strategic ally – Russia. The possibility of creation, at least in the long term, of a uniform economic and human space with the European Union countries of the (EU) is not removed from the agenda. The European-Eurasian perspective shall be held open: Eurasian orientation shall substitute for one-sided European geopolitical orientation of Russia.

As President V.V. Putin of Russia emphasized speaking in Moscow at the meeting of ambassadors of the Russian Federation on June 30, 2016, «Russia not only does not refuse the idea of forming with the EU a uniform economic and humanitarian space from Atlantic to the Pacific Ocean, but considers it the most farsighted in terms of providing a long-term sustainable development of the whole Eurasian continent» [151].

The Big Europe has not become reality yet. But it obviously does not exclude a possibility of movement to the Big Eurasia (together with China, India, Iran, the Republic of Korea, etc.), and in the long term – to a transformed old goal: to the Community of Big Eurasia – from Singapore to Lisbon. This movement to the Community of Big Eurasia will make it possible, among other things, to counterbalance the growth of China, by placing it within a wider framework, and thereby reducing concerns of its neighbours about growing power of the People's Republic of China.

Europeans also do not give up this goal. So, at the beginning of June, 2016 the German Chancellor A.Merkel declared: «I am for Russia's gradual rapprochement with the European economic space, so that we finally have a common economic zone from Vladivostok to Lisbon» [152].

The main goal of Russia in its relations with *the USA* is a long-term course for cooperation, prevention of extension of arising crises to the global level.

The USA, Russia and China are world leaders in terms of production and consumption of primary energy resources: their total share in global production and consumption of these resources is about 44 - 45% [153]. The USA follow the path of increasing the efficiency of use of primary energy, reducing import of energy carriers and ramping-up own production. Their purpose is to decrease dependence on foreign supplies and then ensure steady export of hydrocarbons. The USA strive to repartition the world oil

market and local gas markets, and to oust therefrom other large exporters, first of all to Russia.

Strategic objectives of the USA also include an aspiration to influence decisively the way of forming the rules of trade in the 21st century. This is in particular confirmed by persistent promotion by the United States of two megaregional projects: Trans-Pacific Strategic Economic Partnership (TPP) Agreement signed on February 4, 2016 and the project of Transatlantic Trade and Investment Partnership of the USA and the European Union (TTIP). These are large and far-reaching projects perceived in an ambivalent manner, especially in the European countries⁴⁹. In particular Europeans are afraid that the agreement will seriously violate standards in the field of ecology, law and labour employment in Europe.

We are not able to go deep here into this subject. It has to be studied separately all the more so as new U.S. President Donald Trump elected in November, 2016 in his election manifestos unambiguously supported the USA's refusal of creation of US-centric macroregional communities, in particular TPP and TTIP⁵⁰.

Here we would like to note only that the answer to challenges and risks relating to both projects has to include, in particular, the development and implementation by Russia and its EAEU partners of national strategies of diversification of economy and strengthening of its competitiveness. It is in the interests of Russia and the EAEU to identify and use the best institutional and regulatory practices of TTIP and TTP for the benefit of deepening the Eurasian integration and its efficient positioning on the international scene. As President V.V. Putin of Russia noted, speaking at the St. Petersburg International Economic Forum on April 14, 2016, «The Eurasian Economic Union can become one of centers of formation of a wider integration contour» [154] – a comprehensive trade and economic partnership in Eurasia with participation, in addition to the EAEU, of other CIS countries, China, India, Pakistan, Iran, other interested countries and their associations. The task of forming a «multi-level integration model in

⁴⁹ The EU has been negotiating with the USA for TTIP since July, 2013. It would be the biggest in the world duty-free trade zone with a consumer market of about 820 million people. In addition to the USA and the European Union countries, the project includes Canada, Mexico, Switzerland, Liechtenstein, Norway and Iceland, as well as countries - candidate to the EU members.

⁵⁰ The U.S. President Donald Trump signed the decree on the USA withdrawal from the negotiation process for creation of the Transpacific Partnership on the third day of his inauguration (on January 23, 2017).

Eurasia – a large Eurasian partnership» was confirmed in his message to the Federal Assembly on December 1, 2016.

China slows down its growth rates⁵¹. The period of high growth rates of the national economy came to the end, and now the leadership of the People's Republic of China needs to ensure a stable development. The session of the National People's Congress in March, 2016 adopted the «13th five-year plan». It set a task to provide for economy growth rates till 2020 of more than 6.5%. At the session it was noted that the country had taken the course for carrying out system reforms which will allow to perform smooth transition to stable growth [156]. Therefore, there are grounds to believe that economy growth rates in the PRC will remain nevertheless advancing as compared to other centers of power. In terms of aggregate capacities, China is going to become in the near future the first power of the world. Pursuing a policy of «soft power», the PRC will be capable to provide to its partners considerable economic resources for the development, as well as an access to its market. And in some years Russia will have on its eastern frontiers an even more powerful neighbour than today. It is necessary to account for these new opportunities and to take certain steps so that the increasing power of China is not perceived by Russia and other its neighbours as a threat, but, on the contrary, as an additional chance for own progressive development.

6.4. Energy relationship of Russia with Iran

Cooperation with southern Asian countries, in particular, with Iran may become one of the rewarding directions and a meaningful addition to the «east vector» of the energy policy of Russia. Let's dwell a little upon this example.

Ambivalence of historical development of the Russian-Iranian relations – from military conflicts to peaceful mutually beneficial cooperation – may be an example of building of relations between countries belonging to various civilization communities. At that, Iran is for Russia not only a partner, but also a competitor. Finding a correct balance of objectively existing contradictions is a difficult task.

⁵¹ However, views of growth outlooks in China have never been so inconsistent as nowadays. According to Beijing and optimists who become fewer and fewer, in the forthcoming five years growth rates in the country will be 6-7% per year. But inveterate pessimists predict a recession of 3-4% per year, and maybe more (see, e.g. [155]).

Speaking about the role and importance of Iran in this region, one must be kept in mind that its influence extends from the Mediterranean Sea in the west to Afghanistan in the east of and from Transcaucasia in the north to Aden (Yemen) in the south. For several decades (since 1979) of opposition with the USA Iran proved its resistance to external influences. Without participation of Iran, it is very difficult to achieve significant results in the region, and some problems cannot be solved at all.

The development of ties with Iran, a large Muslim state, strengthens idea of Russia as of a country benevolent towards Islam and open for a «dialogue of civilizations» – the concept consistently promoted by Moscow in upholding the idea of a multipolar world.

Russia actively aspires to establish economic ties with the Middle East, North Africa and South Asia countries along «north-south» axis. And Iran as a transit state has a key role here. At Baku summit on August 8, 2016 presidents of Azerbaijan, Iran and Russia declared that they will use their best efforts to create a 7200-kilometer transport corridor which will connect their countries. And in Iran itself Russia sees essential economic opportunities. According to the Institute of Energy Strategy (Moscow), Russian-Iranian relations in the field of energy develop progressively though available potential is still used insufficiently. Moreover, a comprehensive analysis of Russian-Iranian relations for the last decades in the various areas shows that these relations were not characterized by stability, were subject to temporary rises and recessions, etc. The will of the presidents of Iran and Russia to develop the bilateral relations declared during the summit on August 8, 2016 is a pledge of successful overcoming of obstacles in this way.

Some specific steps have been already made in this direction, So, in February, 2013 the Standing Russian-Iranian Commission for Trade and Economic Cooperation noted that energy industry is one of main spheres of cooperation of Russia and Iran. In August, 2013 the «Road Map of Promising Projects in the Field of Oil, Gas and Petrochemistry» was approved.

The parties confirmed their readiness to continue cooperation in the gas sphere within the framework of the Gas Exporting Countries Forum (GECF), to coordinate their activity to prevent construction of Trans-Caspian Gas Pipeline in order to avoid negative ecological effects.

Within the framework of GECF Russia and Iran may influence regulation of the gas market. This is not about cartel market manipulation, but about joint studying thereof and influencing its formation. As a result the market of

natural gas would become more predictable for supplying countries. Russia is interested, figuratively speaking, in natural gas sales markets «separation» with Iran. Russia operates in Europe, which for several decades is the main consumer of Russian gas. And near Iran there are largest attractive markets in Asia, first of all India and Pakistan. This is a field of potential cooperation.

For example, India and Iran study possibility of laying an underwater gas pipeline on the bottom of the Gulf of Oman bypassing Pakistan. And Russian «Gazprom» has an extensive experience of construction and operation of gas pipelines, which may be useful here.

The parties intend to continue negotiations on possible investments into oil and gas development, production and refining projects (LNG, pipelines, processing, petrochemistry). Russian state company Zarubezhneft declared interest in implementation of oil production project in Iran. Rosgeologiya holding is ready to render services to Iranian partners; Tekhnopromexport company is willing to participate in the project of construction of oil and gas-processing plants in Iran, including oil and gas fields development and surface facilities construction services. West Siberian Oil and Gas Company shows interest in projects relating to hydrocarbons development and production, as well as construction of surface facilities at Iran fields. There are also offers from other companies.

Of course, being realistic, one shall take into account that Russia and Iran objectively are simultaneously partners, and competitors in the oil and gas sector. At they have here both coinciding, and opposite interests. Both Russia, and Iran are interested in steady world markets. And in spite of the fact that they compete for sales markets, there is a wide range of objective factors for coordination of their activity in this sector. These factors include geographical remoteness of Russian and Iranian fields from sales markets, interest in expansion of deliveries of raw materials to world oil and gas markets, etc.

At the same time Moscow shows far-sightedness in issues relating to the market of energy carriers where Iran can compete with Russia. Due to resumed in 2015 export of Iranian oil to Europe the share of Russia in this market reduced. Nevertheless, in March, 2016 when Iran did not accept Russia's offer to reduce oil production in order to maintain price level, Moscow was accepting of Tehran position. In September, 2016 President V.V. Putin of Russia declared that he deemed the recovery of pre-sanction oil production rates by Iran normal. It is likely that when Iran starts

supplying gas to Europe, competing in this market with Russian Gazprom, Moscow reaction will be more or less reserved. Instead of fighting against things that it cannot prevent, Russia keeps calm and looks for methods to minimize damage to its interests. In doing so, it strengthens relations with an important partner.

Energy industry is one of promising areas of cooperation of Russia and Iran: reconstruction of old and construction of new thermal power plants, participation in the development of nuclear energy. So, the «energy bridge» project provides for the export of 500 MW from Russia to Iran, construction of new generating capacities in Iran, modernization of the Iranian distribution energy supply networks. The expected cost of the project is \$8 to \$10 billion.

In 2013 the nuclear power plant in Bushehr started operating at full capacity. In 2014 the countries signed a new package of agreements for participation of Russia in construction of eight more nuclear power units in Iran (additional four power units in Bushehr and four power units for a new nuclear power plant).

The ceremony of laying the foundation stone at the construction site of the second turn of Bushehr NPP (Bushehr-2 NPP)⁵² took place on September 10, 2016. It was noted that it was the beginning of construction of two new reactors featuring the most modern solutions fully complying with so-called post-Fukushima or 3+ generation safety requirements. All technological processes relating to the enrichment and involving risks of double application shall be carried out in Russia, therefore there will be no risks. And spent fuel from which plutonium and other double-application elements may be recovered, according to the contract shall be also processed in Russia [159].

Bushehr-2 NPP is the largest Russian project in Iran and still the only in which Tehran assumed financing (the project is financed by the Iranian customer, NPPD). JSC Atomstroyexport will act as the EPC contractor in

⁵² Respective contracts between Nuclear Power Production and Development Company of Iran (NPPD) and Atomstroyexport were signed in November, 2014. As it was noted in the press release of the State Corporation Rosatom group of companies, «In Bushehr-2 NPP project unique technologies and latest solutions, as well as a new safety concept will be implemented» [157]. According to TASS, actual NPP construction («first concrete placements») are scheduled for the second half of 2019. And currently JSC Atomenergoproekt started the development of the engineering design of the plant. Another enterprise of Rosatom State Corporation, JSC OKB Hidropress Experimental Design Bureau began the development of the reactor unit project. Total cost of the project is \$10 bln, its implementation will take 10 years [158].

charge of «turnkey» construction of two power units featuring advanced VVER-1000 reactors with total capacity of 2.1 thousand MW, as well as performance of civil-engineering survey and collection of basic data of the NPP site [157, 160].

It should be noted that for Iran construction of this NPP, as well as other similar power plants is of great importance. The country desperately needs energy to reach a new «economic miracle» meaning the course declared by the Iran leadership towards «breakthrough after cancellation of the western sanctions». «Look, one power unit enables us to save 11 million barrels of oil. This is about \$400 million per year. When two new one power will have been constructed, the amount will be increased three times. I am telling you – during the time that Bushehr NPP operates, we already saved four billion dollars,» Ali Akbar Salehi, Iranian Vice-President, the president of the Atomic Energy Organization of Iran reported [159].

So, today cooperation but not rivalry obviously prevails in the Russian-Iranian relations. At the same time economic ties of Russia and Iran are still limited. The countries lack mutual trust. There are practically no ties at public level. Nevertheless, building of pragmatic relations based on interests of each country, is quite realistic. Moscow and Tehran need each other to solve wider geopolitical problems. This is thanks to such clear understanding of real cooperation opportunities and borders that it may be not only viable, but also quite successful.

6.5. Taking into account new realities in the energy policy of Russia

The energy policy of Russia is developed taking into account the abovementioned conceptual provisions. The fuel and energy complex of the country accounts for more than 25% of GDP and nearly 30% of consolidated budget, two thirds of currency receipts from export and 25% of total amount of investments into national economy. More than 45% of primary energy resources produced in Russia are exported, providing 70% of total export revenue and exercising a material effect on the Russian balance of payments and state budget. By 2012 customs duties and oil and natural gas extraction tax reached a half of the federal budget income though in 2002 they did not exceed 15%.

Under the influence of global trends the role of the energy industry in the economy of Russia will change: the fuel and energy complex has to turn

from the economy powerhouse into a «stimulating infrastructure» providing for the creation of conditions for the development of the Russian economy including its diversification, growth of technology level, minimization of infrastructure restrictions. This task formulated for the first time in the Energy Strategy-2035 project prepared by the Institute of Energy Strategy (version of May 22, 2014) – in spite of the fact that it was removed from subsequent versions of the document – will remain relevant still for a long time.

However the dependence of the Russian economy on the energy sector shall decrease not due to the reduction of its absolute contribution, but through an advancing development of other sectors of economy [27].

The changed geopolitical status of Russia after the USSR collapse in 1991 affected also the energy industry of the country. It lost part of its energy carriers supply markets, some strategically important ports; the main export pipelines now pass through the territories of new independent states that occasionally created and still creates problems unknown earlier.

Main geopolitical interests of the energy industry of Russia are the following:

- providing for many tomorrows access to new energy resources and markets (hydrocarbon, nuclear fuel, electric energy markets), as well as to financial capital, technologies, services and labour force. Participation in shaping demand and prices in the main markets of energy resources, as well as in formation of these markets;
- influence on the development and participation in the building of the regional and global energy infrastructure, in particular for the purpose of increasing global and regional energy safety, as well as competitiveness of Russian energy resources;
- active participation in international cooperation on environmental and climate change issues;
- using – subject to international law regulations – energy factor for strengthening foreign policy and external economic positions of the country.

The width of Russian geopolitical interests in the field of energy is determined, on the one hand, by the aspiration to be on par with leading Western countries some of which are energy importers. Russia is objectively interested in ensuring collective energy safety, including in this process both exporters, and importers of energy resources. On the other hand, Russia is interested in interaction with main oil and gas exporters, in particular

with OPEC and the Gas Exporting Countries Forum (GECF). This gives a chance to influence to some extent (at least, at the discussion stage) price policy in the world energy markets. However, national and foreign policy interests of exporting countries (including Russia) appear in practice as having more priority, than objective strategic collective interests. Certainly, finally all participants of the world market suffer losses from such (sometimes very self-interested) policy, though to different extents. Thereby the thesis that political factors quite often predetermine state decisions in the field of energy is confirmed once again. And Russia is not an exception.

Strengthening of geopolitical positions of Russia in the field of fuel and energy complex is promoted by the correct balance of its interests with interests of consuming countries and energy resources transit countries. The same purposes are served also by interaction with the International Energy Agency (IEA), the International Atomic Energy Agency (IAEA), OPEC and GECF, such international structures as G20 as well as with centers of power: China, the European Union and the USA. At last, the energy factor is the major integrating link in the former Soviet Union territory.

The predicted place of Russia on the future world energy map is shown in Fig. 28.

Russia on the future world energy map

Trend	Risk	Requirements to Russia
decrease of demand for hydrocarbons	Slowdown of growth	Modernization
Shift of demand for hydrocarbons to Asia	Strong competition in Europe	Diversification of export directions
Advancing increase in production of RES and extraction of nonconventional hydrocarbons	Russia's standing behind, inefficiency	Accelerated development of RES in Russia
Regionalization of world power	Export and investments is not in demand	Optimization of pipeline projects
New phase of development in developed countries	Irreversible lagging of Russia	Innovation development
New generation energy	Inefficiency of Russian energy industry	Creation of future Russian energy industry

Source: Institute of Energy Strategy

Fig. 28. Russia on the future world energy map

7. CHINA AND NEW ENERGY CIVILIZATION

In the previous sections the subject of China has been already touched upon repeatedly. However there this matter had a secondary character and was dealt with as one of lines in the geopolitical and energy strategy of Russia. In this section this subject is the focal point.

In 1922 Bertrand Russell told about China: «Since the time of Confucius the Egypt, Babylon, Persian, Macedonian and Roman empires disappeared from the face of the earth, but China remained». And several decades later the U.S. Secretary of State Henry Kissinger referred China to the same category as sunrise or wind, characterizing this country as a «timeless natural phenomenon», as a state-civilization which «seems to have no beginning» [Quoted according to 161].

A peculiar characteristic of China and the Chinese people is given in the «Survey Report on Modernization in the World and in China (2001–2010)» prepared by scientists-experts of the Academy of Sciences of China. Here it is: «Among 5000 nationalities all over the world, the Chinese people is undoubtedly one of the greatest. It is not only the most numerous nation in the world, it has an incomparable glorious history. During the agrarian era China created the great civilization that has been existing for more than 4000 years, it was there that paper, printing press, gunpowder and compass were invented. In the Middle Ages China was one of world leaders for 1000 years. However it missed a possibility of carrying out industrial revolution, failed to perform modernization in due time though it lasted for about 200 years, and paid a high price for it. Even now China considerably lags behind the leading countries in the field of world development. But the history is made by people, and the future belongs to the entire humankind» [162, page 79].

A state at the heart of which the most ancient civilization lies, a state consolidated by a uniform ideology and managed by an authoritarian regime, deserves closest attention and comprehensive study. However, despite antiquity of the civilization and cultural uniqueness sharply distinguishing China both from his neighbours and from other world in general – and this the importance of this difference is amplified manifold by a huge population size – in the last decades the country has been actively integrating into the world economic ties, and even starts having a determining impact on them.

Therefore, not only applied economic and political, but also civilizational interaction with this country becomes increasingly topical in all areas. This

fully applies to the energy sphere. However, the oil and gas sector (and the energy industry in general) is a key component of modern global economy. But just a «component», the logic of development of which virtually cannot be understood outside the whole global economy. For this reason let's first try to gain insight into China's economic growth problems, especially as not only the energy industry of this country, but also the outlooks of development of the entire world economy depend on them.



Source: Wikipedia

Fig. 29. Map of China

7.1. Economic growth challenges

First of all, it should be noted that modern China is very heterogeneous. On the one hand, foreign business, local authorities and state corporations play the major role in the economy; in recent years the standard of living of the population – in particular, the per capita income, the average salary of inhabitants of cities and villages – improved considerably, extreme poverty reduced significantly, substantial achievements in the field of housing and social security system have been observed. Almost all population of cities and considerable part of population of villages are covered by various social medical care programs. A low level of unemployment – less than 4.5% has been maintained. Migration from villages to cities exceeded 250 million people [163]. The country's progress on the way of innovation development are also impressive. Today China became the world leader in the field of alternative energy, nanotechnologies, partially – pharmaceuticals and mobile payments; it will just suffice to mention plans for building manned bases on the Moon and investigating Mars! It is well-known that the development of such advanced areas as astronautics directly influences achievements in science and industrial innovations – and this is one of few things that China lacked for a confident world leadership [164, 165].

But on the other hand the private sector encouraged by the state quickly grows; by 2016 it accounted for production of 65% of GDP of China, for 80% of workplaces and over 90% of new workplaces in the country. As Dr. Xiang Bing, director of Cheung Kong Higher Business School (Beijing) noted at the St. Petersburg International Economic Forum on June 17, 2016, «in terms of many indicators China is more capitalist, than any other country in the world. There is no general health care. Education is free only to the ninth form. There is no global pension system» [166].

Besides, currently in China an extensive macroeconomic planning system functions, which holds a key place within the state regulation system and is characterized by a high level of efficiency⁵³. From the moment of beginning of its functioning in 1953 macroeconomic planning has been continuously developed and improved. In 2000 before the accession to the WTO China refused directive state plans, and passed to drawing up long-term programs.

⁵³ Throughout nearly 40 years of transformations China develops on a regular basis plans of structural reforms of the Chinese economy for the next ten years. The first appeared in 1984, followed by 1993, then 2003 and 2013 plans [168].

At the stage of transition from the 12th to the 13th five-year plan the macrolevel planning system underwent additionally some essential changes relating to the expansion of social development indicators in China [163].

Such a freakish interlacing of characteristic features of various economic structures in combination with a wide involvement of the country into globalization processes makes an assessment of the state and outlooks of economic growth of China rather difficult. This explains, in particular, great variety of estimates observed both in the world mass media, and in special publications.

According to the Institute of Far Eastern Studies of the Russian Academy of Sciences [167], during the first years of the last decade China developed under conditions of domination in the Chinese geopolitics of two key components which are implicitly contradicting each other.

On the one hand, basic foreign policy principles of Deng Xiaoping laid down in the 1990s – «not to join», «to keep head down», «to show restraint and modesty», etc. – remained in force. On the other hand, after in 2010 China ranked second in the world in terms of GDP size, some foreign policy provisions of the great reformer lost edge. The Chinese political management and expert community, under conditions of general change of quality and scales of the Chinese foreign policy, felt a need for the development and adoption of new ideas and approaches, such as:

- «*joint development*». As envisioned by the Chinese politicians, the development and modernization processes have to proceed simultaneously in all countries thereby creating additional effect of mutual interest in partnership and preserving stability;
- «*deep changes*» which objectively require a certain reconfiguration of the Chinese foreign policy mechanism;
- «*harmonious world*». This concept has both a foreign policy orientation – developing of harmonious relations of the PRC with neighbouring and faraway countries, maintaining «harmonious relations» between the countries, and internal political orientation – formation of a «harmonious society» in China;
- «*joint liability*». Here China's attempt is discernible to disassociate itself from the American model of responsibility a half of which (within G-2) the USA would like to assign to China;
- «*active participation*». This thesis contains a hidden message testifying to a change of accents in the Chinese foreign policy, transition

to a more active positioning in the world – both in bilateral, and multilateral formats: within the framework of the UN, SCO, RIC (Russia – India – China), BRICS, ASEAN +1, ASEAN +3, «China – South Korea – Japan» triangle, etc.

All the above five ideas are connected by one logical thread. Officially formulated tasks follow therefrom: «overcoming a narrow regionalism in foreign policy» and «overcoming a developing state complex» [167].

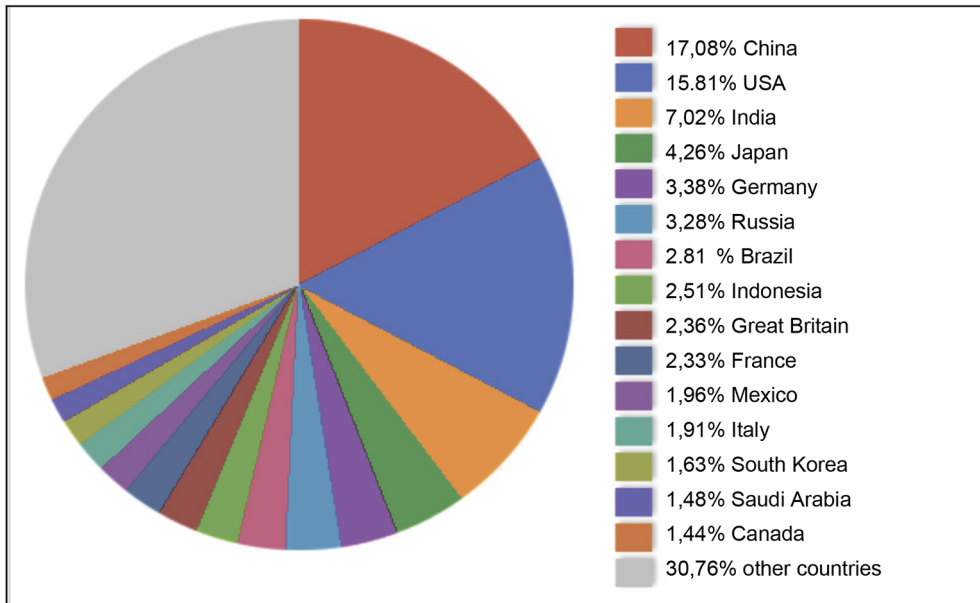
Already reached results of the solution of these tasks are self-evident.

In 2015, according to the International Monetary Fund (IMF), the PRC's share in the world GDP in terms of purchasing-power parity (PPP) was 17.08% [51]. For comparison: the USA share was 15.81%, and the share of Russia – 3.28% (Fig. 30). China's contribution to the Asian region GDP growth was more than 50%.

At the same time even a superficial analysis testifies that in recent years the economy of China faced some problems and challenges. Their analysis was given, in particular, at the St. Petersburg International Economic Forum – 2016 [166]. Let's specify the main of them:

- the economy of China slows down its growth;
- in 2015 the volume of foreign trade of the PRC decreased by 8%: export was reduced by 2.8%, and import, by 7.6%. In January, 2016 the falling of indicators on a year-on-year basis was 11.2% and 18.8%, and in February – 25% and 13.8%, accordingly;
- rapid growth of the total national (cumulative) debt. At the beginning of 2013 yet leading world analysts believed that China has a considerable potential for increasing this debt in case of need, but in 2015 they sounded the alarm.
- in traditional industries of China capacities are loaded only for 70-75%;
- investments into fixed capital in 2015 amounted to 10.2% against 15% in 2014;
- expectations of further slowdown of economic growth resulted in capital outflow from the country: in 2015 it reached \$676 bln;
- capital outflow caused yuan weakening. The authorities of the country were forced to spend gold and foreign exchange reserves to support the national currency: in 2015 they were reduced by \$482 bln (by \$762 bln from the middle of 2014), to \$3.23 trillion.

The main of these problems and challenges are briefly reviewed below.



Source: Wikipedia [169] according to the IMF [51]

Fig. 30. Share of 15 largest countries in the global GDP (PPP) according to the IMF

GDP dynamics. According to the official report of the Chinese state-run Xinhua News of March 1, 2016, in 2015 China's GDP growth was only 6.9%, which is the lowest indicator for the last 25 years. Such dynamics is also confirmed by the estimates of the IMF. According to the Fund, if in 1998-2007 annual average China's GDP growth rates were 9.9%, and in 2010 even 10.6%, since 2011 they have been continuously decreasing: 7.7%, in 2012 and 2013, 7.3% in 2014, and 6,9% in 2015 [171].

Such dynamics of GDP growth of the PRC together with other problems of the Chinese economy which will be envisaged below, gave a reason to the western press, by reference to various financial analysts, to burst into a set of publications describing apocalyptic scenarios of economic development of China. «China's deep crisis», «Hard landing of the Celestial Empire», «Panic at Chinese exchanges», «Yuan collapsed», «The end of the Chinese miracle» – such were the headings of many western newspapers. And most of these articles were filled with such emotional adjectives and verbs as «enormous», «incredible», «drastic», «massive», «terrible», «deadly», «failed», etc. [172].

But, generally speaking, in recent years in China the same asymmetry as in the whole world economy is observed: rather modest positive dynamics of GDP against the background of negative dynamics of international trade. It is a critical factor: after all the leadership of the PRC has been pursuing for the last decades a policy of economy orientation to foreign markets.

In 2016, according to preliminary data of the National Statistics Bureau of the PRC, the growth of national economy was 6.7%, well within the official forecast framework⁵⁴, in particular 6.8% in the fourth quarter, exceeding by far the forecasts of foreign analysts [173]. The growth was reached thanks to the increase in public expenses and record bank lending amounts. So, in March, 2016 financial authorities of China allocated about one trillion yuans of new credits to the national economy, and total amount of injections in the first quarter reached 2.6 trillion yuans. [174]. However, according to the estimates of experts of Economist Intelligence Unit, nobody cherish illusions or expects that GDP growth will continue in 2017. Subsequently, recession in the real estate market and a fight against lack of supply in the raw sector will have a strong impact on demand and production rates [173].

In the January (2017) release of the «World Economic Outlook» the International Monetary Fund recognized that growth rates of China in 2016 were a little higher, than it was expected. Along with expectations of further government support measures, afford ground to the IMF for adjustment of the PRC's growth forecast for 2017 upto 6.5%, by 0.3 percentage points more than in October forecast [175].

The said financial injections in China's economy resulted in the ***growth of internal and external debt*** of the PRC. By the end of March, 2016 the amount of external and internal debt of the PRC jumped up to 163 trillion yuans or \$25 trillion. Thereby total debt of China grew, by estimates of The Financial Times, to record 237% of GDP which is higher than in other countries with growing economy [174], and in terms of amount of the total debt – in all sectors of economy, including the banking sector and households – China matched developed economies of the world. According to the Bank for International Settlements, their average debt load is 175% of GDP. Japan is the leader by this indicator – 379% of GDP. Greece with 300% of GDP ranked second place. The debt of the Great Britain and the USA is 245% and 244% of GDP, accordingly [174].

⁵⁴ The National Commission for Development and Reforms of the PRC established target range of GDP growth of 6.5% to 7% [174].

It should be noted that Chinese debt grows by high rates: by the end of 2007 the amount of the total debt of China did not exceed 148% of GDP [176], but already by the middle of 2014 the total debt of companies and regional authorities of China, according to Standard Chartered bank, grew up to 251% of GDP of the country. Such growth confirms concerns expressed earlier that a high level of debt under conditions of slowdown of economy growth rates leads to inefficient capital utilization. Whole cities of constructed, but not populated apartment houses, and surplus of production capacities in the industry may serve as a proof of this statement [177].

A rapid growth of corporate debt which accounts for a lion's share of the total debt of China causes special concern of experts. By the middle of 2016 it grew by more than 60%, to 165% of GDP. As experts believe, «a national debt crisis looms in front of Beijing against the background of business defaults and bankruptcies, low level of industrial profit, dispersion of profit on investments and quite a real probability of the next recession in the real estate sector. Whether or not Beijing can cope with these problems in the next months, this is critical for economic, social and political stability of China for many years to come» [178].

As for the *reduction of the foreign trade volume* of China, it only repeats (and this in a softer form) general negative trend in the world trade which, according to the WTO, in 2015 shrank by 13.8%. The reason is a dip in prices in the world markets of agrarian products, energy resources, metal and many other raw materials. In 2015 virtually all main world economies recorded a reduction of foreign trade.

It should be noted that traditional mistrust of western community to PRC's official data and materials generates considerable number of so-called «independent» estimates of economic situation in China. Gordon G. Chiang's article *Will 2016 Bring the Collapse of China's Economy?* published on December 29, 2016 in the American magazine *The National Interest* is indicative in this respect⁵⁵. In particular, the article asserts that the current situation in China is much worse than the National Bureau of Statistics reports. According to official figures, in the 3rd quarter of 2016 GDP of the PRC grew by 6.9% after a 7.0% growth in the first half of the year. However Willem Buiter, Citigroup's chief economist, estimates this growth only at

⁵⁵ Gordon Guthrie Chang (Chinese: 章家敦; pinyin: Zhāng Jiādūn) is a well-known Chinese-American lawyer, journalist and observer, television commentator, writer, and consecutive anti-Chinese activist. Became popular after publication in 2001 of his book about future China's collapse (according to Wikipedia).

4%, and unnamed «people in Beijing» «in private conversations spoke about 2.2% in the middle of the year». Electricity consumption remains the most reliable activity ratio of Chinese economy, and in January-November, 2016 it increased only by 0.7% (China's National Energy Administration) [179].

Professor Frank Xie Tian from the Business School at the University of South Carolina in Aiken claimed that the economy of China grows only by 5-6% per year. And his colleague Larry Lang from Hong Kong at first declared that the real growth of the PRC's economy in 2011 will not exceed 2.9%, but based on the results of the year adjusted his forecasts and discovered a 10% reduction of China's GDP [164].

Similarly G.G. Chiang also estimates the amount of the internal and external debt of the PRC: «possibly, 350% of GDP now» [179]. At the same time according to official figures the national debt of China is less than 60% of GDP, and corporate debt at the beginning of 2016, by estimates of the International Monetary Fund (IMF), – about 145% of GDP, «that is very much by any standards» [176].

Closely to Chiang's The estimates and opinion of V. Katasonov, professor of the International Finances Chair of the Moscow State University of Foreign Affairs: «The economy of the PRC reminds me a bubble inflated by a pump named «the U.S. Federal Reserve System printing press». China developed solely with the help of debt money, and the back of the «miracle» is a huge external and internal debt of the PRC which cannot even be serviced today» [176].

However, it should be noted that the statistics of the IMF and official Beijing does not match because of a difference in calculation techniques. But anyway, as A.V. Ostrovsky, deputy director of the Institute of Far Eastern Studies of the Russian Academy of Sciences, member of the European Association of Chinese studies, noted, corporate debts is it not a national debt. And Chinese banks, if they consider it necessary, will ruthlessly make bankrupt any enterprise, and will write off the debts. Such cases are known. There are 14 million enterprises in China. So, every year 1 million enterprises in the PRC go bankrupt, and 1 million new enterprises are created every year. In other words, Chinese banks got used to bankruptcies [176]. Meanwhile China has enormous reserves – for example, there are 55 trillion yuans (about 80% of GDP) on savings accounts of the population, and about 40 trillion yuans (about 60% of GDP) on current accounts of enterprises [176].

Curtailment of investments into fixed capital and capital outflow from the country. A.V. Ostrovsky, deputy director of the Institute of Far Eastern Studies of the Russian Academy of Sciences assessed these problems as follows: «Last year (2015) investments into fixed production assets in China amounted to 56 trillion yuans, more than 70% of them being own resources of enterprises. And only 12% of all investments are internal credits. How anything may happen to China's economy at such investments structure?! Currently Chinese enterprises create new production facilities at their own expense – to solve own production needs» [176]. As for capital outflow, «Any entrepreneur invests money where he may get the greatest profit. Until recently foreign capital in China has been obtaining profit. Foreign investments last year amounted to \$124 billion. Capital export exceeded this amount: \$128 billion. I do not believe in one trillion reported by Bloomberg. Did they begin exporting machines and equipment in large quantities? It is impossible to make it so simply, they should be sold to someone. But sale of equipment is an absolutely senseless business project. Especially as money is invested in enterprises. To «evacuate» enterprises worth one trillion dollars, many free areas in other countries are required. Therefore figures given by Bloomberg are unrealistic» [180].

In general, evaluating the situation in China, A.V. Ostrovsky noted: «the main markers of Chinese economy show: talks about «bad debts» which continue for the third year, are unfounded. I see in it only an attempt to undermine power of Chinese economy by propaganda methods, explaining to foreign partners of Beijing that they should not deal with Chinese as the economy of the PRC is doomed to a hard landing» [176]. He also adds: «In practice, Chinese economy is not so bad as it seems. Yes, it bears risks, but these are long-term risks: demography, ecology, shortage of energy resources. For sure, they will not have any substantial adverse effect on the development of Chinese economy in the next five years ...» [176].

The IMF also gives a weighed assessment of the situation in China: «The current slowdown of growth in China is mainly caused by investment and export behaviour. Weakening of investments reflects correction after a long period of very rapid growth. Due to the size and openness of China's economy and high levels of investments, as well as an important share of import resources in its investments and export, reduction of growth rate caused considerable global secondary effects in trade, including both direct (decrease in demand for products of trading partners), and indirect effects

(impact on world prices of specific goods imported by China, for example, exchange traded commodities), and influence currency rates and asset markets of other countries» [51].

As for other problems and challenges, experts agree in opinion that China has exhausted possibilities of «easy» growth. The model based on huge **resources of cheap labour force**, economic openness (under state control) and conscious retreat into the shadows of world policy has become obsolete. Labour force rises in price⁵⁶, and its requests grow [181] (Fig. 31 and 32).

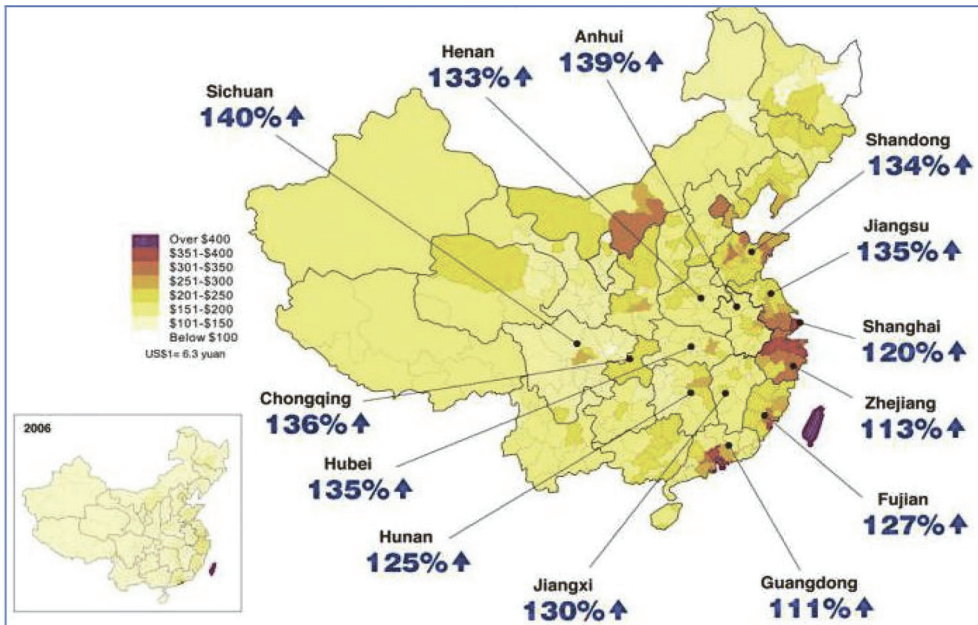


Source: Ministry of Human Resources and Social Security of China (MOHRSS) [182]

Fig. 31. Dynamics of average annual salary growth in China

⁵⁶ Suffice it to say that in recent years, after devaluation of rouble, average salary in China exceeded average salary in Russia. China bypassed Russia in terms of average salary already in 2015. According to the Russian Federal State Statistics Service (Rosstat) average monthly salary in the Russian Federation in 2015 was about 33 thousand roubles that, given average annual exchange rate of 63 RUB/USD was about \$523. Average salary in China by 2015 reached 57,361 yuans (CNY) per year that at annual average exchange rate of about 6,40 CNY/USD was about \$746 per month [183]. According to the Russian Sberbank the average salary in Russia in the first months 2016 fell already to \$433 per month [184].

It should be noted also that all last years official Russian economists claimed that wage increase outracing labour productivity is one of damnations of the Russian economy. So, the head of the Central Bank E.S. Nabiullina said that it creates additional inflationary effects. Russian Prime Minister D.A. Medvedev called low work performance the main brake for economic development [185].



Source: [183]

Fig. 32. Average monthly salary growth in the industry of China, 2011 as a percentage of 2006

Another real-life problem of modern China is ecology. Environmental problems in China are currently one of the most serious in the world; China is the leader in terms of air, water and soil pollution and the situation continues to worsen. The most burning environmental issues are [186, 187]:

- Air pollution, especially in large cities, where it reaching catastrophic levels. In two thirds of cities maximum admissible air pollution is exceeded five times.
- Land degradation. This includes loss of arable lands, desertification, disappearance of boggy territories, soil salinization and erosion, degradation and impoverishment of pastures. The cities and settlements are filled up with sand and dust. Only to Beijing half a million tons of sand are drifted annually. Tens of millions of tons of dust and soot are annually carried away by air flows to other countries. Cultivated lands become contaminated with solid industrial waste and suffer from excessive use of pesticides and mineral fertilizers, woods have been cut down everywhere. The level of pollution and

condition of soil in China are state secret. At least, that was how the Ministry of Environmental Protection explained its refusal to publish complete results of soil condition research.

- Pollution and shortage of water. In China 75% of rivers and lakes and 90% of ground waters are heavily polluted. Water of many rivers is so toxic that it is not suitable even for watering. Besides, dumping of effluents made water in the rivers of China non drinkable and not suitable for fish farming. Only into the largest river of Asia, Yangtze, billions of tons of the untreated waste water are discharged. In addition, there is a drying of lakes and rivers, and because of extremely large consumption of ground waters dozens of cities sink.
- Increasing scale and frequency of natural disasters resulting from human activity.
- Accumulation of garbage.

These and other environmental problems in China are the reason of huge economic losses, social conflicts and deteriorations of health of people. So, on one third of the territory of the country acid rains doing huge harm to human health are registered. They affect eyes, causing sharp conjunctivitis, and airways that leads to bronchial asthma, cough, pulmonary diseases. Detailed research conducted by the World Bank testify to mass mortality of people in the country from smog – annually 750 thousand people die because of it. According to the same research more than 60 thousand people became victims of use of contaminated water and died of gastrointestinal diseases, infectious diseases of liver and kidneys. Environmental pollution leads to mass cancer diseases from various types of which, according to experts, 1,4 million people die annually [187].

One of reasons of air pollution is the dominance of coal energy industry (coal is burned by about 80% of thermal power plants of the country – Fig. 33). According to researches of Chinese authorities, most air pollutants represent smallest particles which are formed as a result of coal burning without preliminary cleaning, exhaust gases and smoke of industrial productions, households and fire chambers. Improvement of the situation in this field will entail a rise in price of products and reduction of growth rates.

Another problem is the growth of social expenses. Population aging, raising of standards of living, the need not avoid a big gap in standards of living, as well as care of increase in internal consumption bring about a growth of state obligations. In the future this will become a heavy burden for China [188].

China also faces other problems and challenges: social tension, excessive credit leveraging, low level of GDP per capita, danger of economy overheating and a large-scale crisis, shadow banking issues, etc. [166].

However, as Peter Bottelier, former chief representative of the World Bank in China, notes, «...in the past the Chinese economy also faced grave problems, but right actions and solutions of Chinese leaders always prevented big trouble. Currently China has a space for improvement of market reforms, the taking of comprehensive measures for economic development and further improvement of the law system is a key to success» [165].

Among major problems facing the Chinese economy experts also specify excessive state intervention. As Andy Xie, an independent economist from the PRC noted during discussion at the SPIEF-2013, «The problem is that Chinese authorities are keen to interfere with economic processes. This is the prime cause of all difficulties». He also added: «You should not worry about Chinese people or Chinese government. The population of China is oriented towards market values. If the state ceases to interfere, the Chinese economy is heading for a boom» [168].

Complexity and large number of the problems and challenges facing modern China do not make it possible to tell unambiguously how much growth rates of the Chinese economy will be slowed down in the next years. Nevertheless, such attempts have been made.

Some experts, as in particular G.G. Chiang, believe that «Chinese economy never seemed to be arranged reasonably, but trust – both within the country, and beyond – held it afloat. Recently, the trust has been disappearing quickly, and Beijing does not know how to return it, except as using the same methods which do not work anymore. Chinese technocratic managers cannot change the descending trend in the economy. Maximum that they are capable of is to slow down the falling using political methods, which will make the final even worse» [179].

Other experts believe that «with or without punitive trade measures of the USA, 2017 is going to be a difficult year for China. Though the biggest problems of the Chinese economy originate from within, external factors, whether it be policy of the next administration in Washington or an unexpected crisis in Europe, may aggravate these internal problems. And as soon as the new year will begin, the Chinese leaders have to be on the alert as threats to social and economic stability in the country will grow» [178].

REGARDING «FUTURE ENERGY»

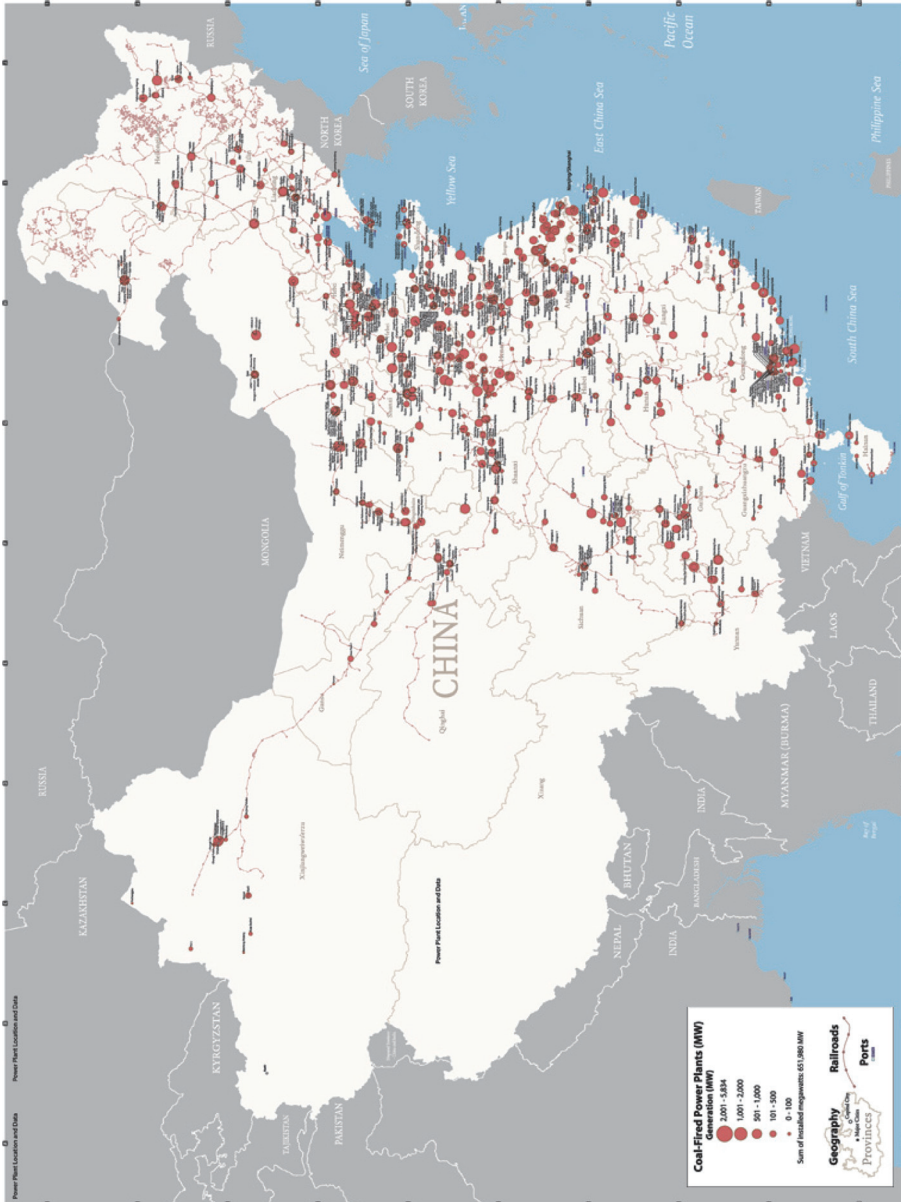


Fig. 33. Coal power plants of China

Source: [164]

Besides, the continuing use by China of economy priming measures given further rapid growth of the credit burden and slow progress in solution of the business indebtedness problem, and in toughening budget restrictions of state enterprises, according to the IMF experts, raises the risk of a sharper slowdown of growth rates or of a destabilizing adjustment. These risks are aggravated by a pressure created by capital outflow, especially under less stable external conditions [175].

Third experts proceed from the fact «that in the near future, at least within the 13th five-year period, an economic crisis does not threaten China. The current economic risk does not bear serious threat to stable development, which is confirmed by high GDP growth rates as compared to other countries, the financial system is stable, the national debt is moderate, financial resources available on bank accounts of most enterprises and population are some kind of «safety cushion». A big share of growing money supply (M2) with respect to GDP represents a certain risk for the Chinese economy, however the government and the People's Bank of China, using financial and monetary measures, have been for a long time stimulating growth of investments into economy. It not only provides a high GDP gain, a noticeable growth of the volume of foreign economic relations and growth of population income, but also relatively low inflation throughout a long time frame» [189].

As Dr. Bing Xiang noticed, «people of my age experience communism, socialism and real capitalism. And even feudalism. Command economy, market economy. We saw everything with our own eyes; we survived all this. I hope, we know that we do when we look forward. So I am optimistic» [166].

As for the official position of the leadership of China regarding country economy development outlooks, it is stated, first of all, in the State Plan of the PRC for the 13th five-year period (2016 - 2020) and its constituent documents (industry development programs). Presenting the draft of this State Plan at the Fourth session of the 12th National People's Congress (on March 5, 2016), the PRC State Council Premier Li Keqiang noted that «the analysis of all factors shows that the economy of China will face even bigger and more complex problems and challenges» [190]. Among external problems Li Keqiang mentioned weak trade growth rates, acute fluctuations in financial markets, as well as increasing geopolitical risks. Internal problems, according to the Chinese Premier, are change of the economic growth model, difficulties relating to structural reforms, as well as growing

pressure upon national economy. Despite it, the Chinese Premier assured that «there are no such difficulties» that China could not overcome [190]⁵⁷.

At the session of the National People's Congress it was recognized that former incentives of growth of the Chinese economy – tremendous investments into fixed assets of the industry, infrastructure, enormous export volume and engagement of an army of unqualified and low-skill labour force reached their limits, and China will look for new reserves of economic growth. Suggested new reserves/sources of growth include expansion of the domestic market due to the growth of purchasing power of population, considerable extension of offer on the part of the services sector and development of environmentally friendly industries [163].

The approved Plan for the 13th five-year period suggests as the basic principle of social and economic development continuation of the government activity aimed at further implementation of the policy of reforms and openness which means continuation of the course set as early as in the 1980s of the 20th century. The government of the PRC determined five principles of development of the economy for the new five-year period: innovation, harmony, environmental friendliness, openness of economy and joint development.

In compliance with these principles the following main tasks will also be solved [163, 166, 190, 191]:

- Ensuring GDP growth in 2016-2020 at a rate of 6.5-7% per year to reach the target set by the Chinese President Xi Jinping to build by 2020 so-called «middle-income society»/«society of average prosperity» (*xiaokang* society, that is «moderate well-being» society. According to these plans, in 2020 GDP in PPP terms has to exceed \$13.8 trillion;
- Fight against poverty. By 2020 it planned to bring 70 million people beyond the poverty line (by the end of 2014 70.17 million Chinese living in rural zones were below the poverty line with the annual income of 2,300 yuans or \$376). At the same time, GDP per capita shall grow from present \$8000 to \$10,000;

⁵⁷ It should be noted that at the end of February, 2016 Li Kèqiáng, the Premier of the State Council of the PRC at the meeting of Ministers of Finance and managers of Central Banks of G20 countries, which took place in Shanghai, assured participants that the government will be able to cope with a difficult international and internal situation, and the economy of China still possesses «a huge potential and flexibility» [191].

- Implementation of the planned birth rate policy. In 2015 the Communist Party permitted all families to have two children therefore already in the near future over 90 million Chinese families will be able to have the second child. Also the policy aimed at enhancements in the field of family planning and mother and child health care will be improved. Besides the system of registration of newborns will be updated. According to official forecasts, by 2020 the population of the country will be 1.42 billion people;
 - Change of the economic development model and transition to the innovation economy. Further progress in the field of information technologies, new types of energy resources, new materials, aircraft building, medicine and robotized production is expected. By 2020 60% of economic growth of China have to be connected with technology innovations, and science share in GDP is to reach 2.5%;
 - Carrying out structural reforms of economy to reduce excess production capacities. As a result of implementation of these reforms about 1.8 million people will lose their jobs. Personnel reduction will affect first of all coal and steel industry. A special fund in the amount of 100 billion yuans (\$15.3 bln) will be created, the main part of which will be used to support employees who will suffer at reduction of capacities in the heavy industry. Steel, energy and chemical industry will be subject to hydrocarbon emission control;
 - Modernization of the agriculture and carrying out urbanization. By 2020 it is planned to accommodate about 100 million rural migrants in cities and settlements. Thereby, the share of population residing in cities will reach 60%. It is planned to create several city agglomerations and economic growth poles. More than 50 million new workplaces will be created for inhabitants of rural areas;
 - Development of transport infrastructure. Only in 2016 investments into development of motor roads and railroads will amount to 2.45 trillion yuans (about \$377 bln). By 2020 total length of the network of high-speed long distance railways will be increased by 11 thousand km and will reach 30 thousand km, 50 new airports will be constructed;
 - Carrying out a military reform which has to be completed by 2020.
- Besides, by 2020:
- Requirements to the observance of the ecological legislation will be toughened. In this context, water consumption per each 10,000

yuan of GDP has to decrease by 23% of the present level, and the efficiency of energy resources consumption has to increase by 15%. Carbon dioxide emissions will decrease by 18%.

- Income tax and real estate tax rates will be reduced.
- China is going to carrying out more flexible monetary policy to handle the issue of critical overload of industrial capacities.
- «Energy revolution» will begin, which means priority use of the energy of wind, sun, nuclear power, as well as biomass raw materials.
- The private sector share will increase, in particular, private investors will get access to strategic sectors (energy, telecom, finance).
- The reform of the financial sector will continue, the return on investment will improve, new financial risk control mechanisms will be created, the reform of state corporations will keep on.

It is also planned that in the next five years China will continue the policy of openness of its economy to the outside world, in particular in such traditionally closed sectors as oil and gas, energy industry, telecommunications. The authorities promise to attract foreign investors by establishing more transparent rules of business and practice of tax benefits to investors. Financial market liberalization will go on (the authorities of the PRC already facilitated access of foreign finance companies to the domestic bond market the volume of which is estimated at \$5.4 trillion).

Completing this section, we would like to note that openness threatens with excessive dependence upon unstable environment in export markets. However it becomes more and more difficult to remain in shadow and to hide one's ambitions: the mere fact of presence of China in the world policy and economy raises flags almost everywhere and provokes counteraction [181].

7.2. Foreign economic and energy policy of China

Dynamic development of the PRC at the end of 20th – beginning of the 21st century gave to experts grounds to claim that by 2025, in terms of accumulated potential, this country will be able to match the USA, becoming their main competitor not only in Asia, but in the world in general.

But already now China is one of leading geopolitical players in the Asia-Pacific and the Central Asia.

China's transformation into one of world centers of economic development influence also its external economic aspirations: they are aimed in four directions meeting national interests of China:

1. *Central Asia Countries.*

China is interested in sustainable political, economic and social development of the region. Safety of its border territories, its own social stability, implementation of ambitious plans of development of the western regions of the PRC depend on it. And not least of all – extension of ties with Russia, the Middle East and Europe [192].

Ever increasing need for energy carriers forces China to take leading positions in the development of oil and gas fields in the Central Asia and in the Caspian Sea region. Beijing has also such strategic lever of pressure upon adjacent countries (in particular Kazakhstan), as cross-border rivers. Interest of the Central Asian countries in the growth of influence of China in the region is explained by the fact that it creates for them an additional opportunity for manoeuvring between the USA and Russia. This is the area of intersection of interests of China, Russia and the USA aiming at domination in the region.

2. *India*

The main China's problem here are disputed boundary territories. At the same time, the potential of common economic interests, in particular in the field of energy and safety, may induce rivals to settle their boundary issues as soon as possible.

3. *Northeast Asia*

This is perhaps the top-priority area for China. This region is the sphere of its vital interests. The interests of many countries, including the USA and Japan are interlaced here. China strives to secure and expand its influence here, gradually forcing out the USA from the region. Of course, it will be a long process. But time factor never was essential for China.

4. *Hong Kong, Macau and Taiwan.*

When it comes down to these entities, Beijing considers the relations with them as its internal affair. Consolidation of historically uniform territories will make China financial and economic leader in the region. Moreover, it will dominate geopolitically all states in the Asia-Pacific region. China will control sea and air space in the East China Sea area, and in the long term – in opposition to the USA and Japan – a part of the Pacific Ocean. In other

words, China will seek more and more persistently after consideration of its regional and global interests.

Such geopolitical factors as instability of the situation in supplier regions, competition of large powers for control over sea lanes (the Strait of Hormuz and the Strait of Malacca, etc.), forces China to work actively also in new regions which did not enter earlier the area of its national interests. The geography of cooperation of the PRC with Africa, Middle East and Latin America countries extends and its nature changes. For Chinese companies, it is important to control not only own oil and gas production projects, but also pipelines by which product are delivered to the PRC. Increased aspiration of China to cooperation in the energy sphere with Russia and with Central Asia countries shall be also envisaged in the same context.

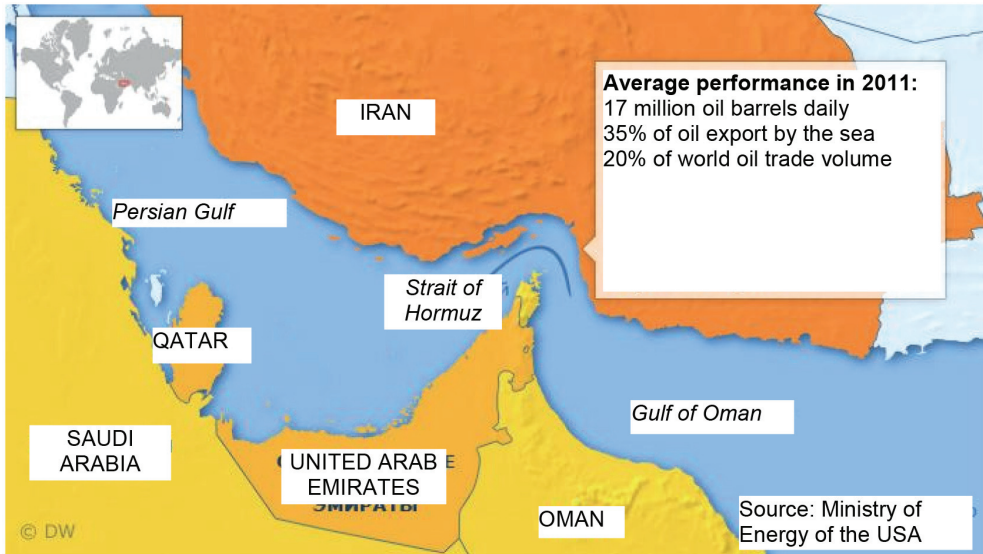
To respond adequately to foreign policy and external economic challenges and problems, a holistic foreign energy policy has being actively developed in China, the main priorities of which shall be examined in the following section.

The Silk Road Economic Belt project already mentioned in section 5.4 has been holding a special position in the external economic policy of China in recent years. However, its implementation will have not only economic effects.

The project has a substantial intercivilization potential that may benefit to all countries relating (directly or indirectly) to the Silk Road project. Progress in the «dialogue of civilizations» towards deeper interpenetration and mutual enrichment of cultures of people of these countries will in no small measure depend on its implementation⁵⁸.

The idea to combine efforts and to create on the basis of innovation methods of interaction the «Silk Road Economic Belt» (SREB) was suggested by the Chinese President Xi Jinping in September, 2013 during his visit to Kazakhstan. As it was declared, the purpose of the initiative was «to strengthen commercial ties and cooperation in order to boost the development of Eurasian countries». In October, 2013 in Indonesia a similar initiative aimed at development of cooperation with Southwest, Southern and Southeast Asia countries under the name «21st Century Maritime Silk Road» was presented.

⁵⁸ *Historic reference.* The Great Silk Road as a trade highway represented a system of caravan roads connecting the East to the West throughout nearly 18 centuries (since the 2nd century BC). It ceases to exist completely by the 16th century due to the development of navigation along the coasts of the Middle East, Southern and Southeast Asia, as well as many wars that broke integrity of the route more than once. And in the Middle Ages the so-called Maritime Silk Road connected ports on the coast of China with Persia and Arabian Peninsula.



Source: yandex.ru/images

Fig. 34. Strait of Hormuz



Source: yandex.ru/images

Fig. 35. Strait of Malacca

Generally speaking, SREB is not the first project of revival of the overland Great Silk Road suggested in recent years. The program of creation of an international transport corridor Europe – Caucasus – Asia (TRACECA) is another attempt of activation of the ancient trade route between the East and the West. In the summer of 1998 12 countries of the Caucasus and Central Asia with the assistance of the USA reached an agreement for the creation of a railway, sea, air and automobile transport corridor from China and Mongolia to Europe, bypassing Russia. But this integration project has never been implemented. In the summer of 2011 the US administration published the concept of a «New Silk Road». It stipulated creation of an infrastructure connecting the Central and the Southern Asia through Afghanistan and liberalization of regional trade. Within the framework of this program, several highways, bridges, energy lines and a rail road spur to Mazari-Cheriffe between Iran and adjacent Central Asian countries were built.

Besides, despite existing risks, it is planned to build a gas pipeline Turkmenistan – Afghanistan – Pakistan – India (TAPI) and a high-voltage power transmission line from Kyrgyzstan and Tajikistan to Pakistan through the territory of Afghanistan (CASA-1000 project – see below).

Unlike the American project the Chinese project of formation of the «Silk Road» economic zone is really tremendous (Fig. 36 and 37). It covers a wide horizontal strip – from the Pacific Ocean to Europe, including Southern and Central Asia countries, as well as Transcaucasia. Through the creation of a zone of close economic, political and humanitarian relations it will integrate 18 countries of Eurasia with a population of 3 billion people (more than 40% of the Earth population). The project includes all SCO member countries. However from the point of view of regional cooperation it exceeds by far the limits of the SCO.

This belt will pass across Central Asia, Russia, Belarus, the European countries. The maritime route will pass via the Persian Gulf, the Mediterranean Sea and the Indian Ocean. There is also an option with routes via African countries.

China is going to invest in the project more than \$40 billion from a special fund. The Asian Infrastructure Investments Bank (AIIB) already approved a \$50 billion credit. The funds will be allocated for construction of rail roads, ports and other facilities. And according to WantChinaTimes estimates, total investments in the project will exceed \$22 trillion.

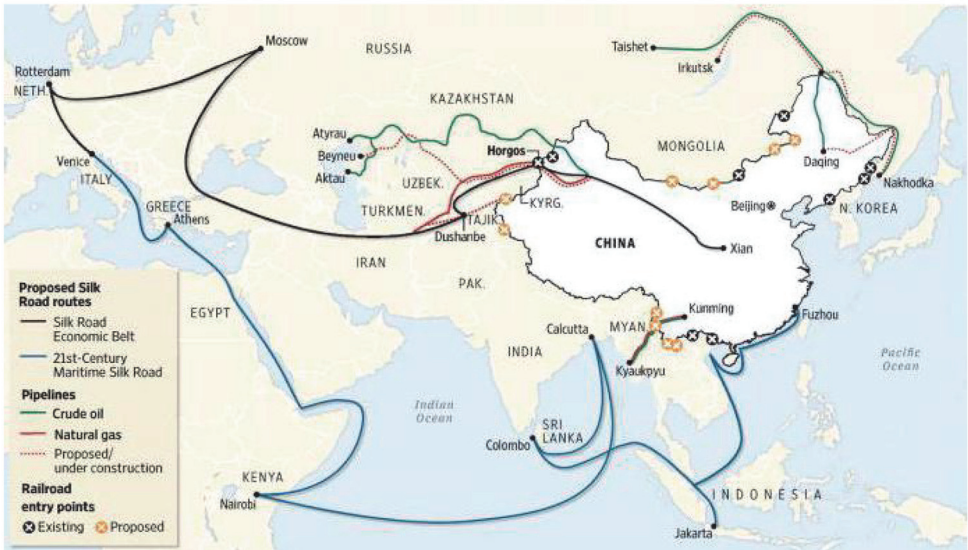
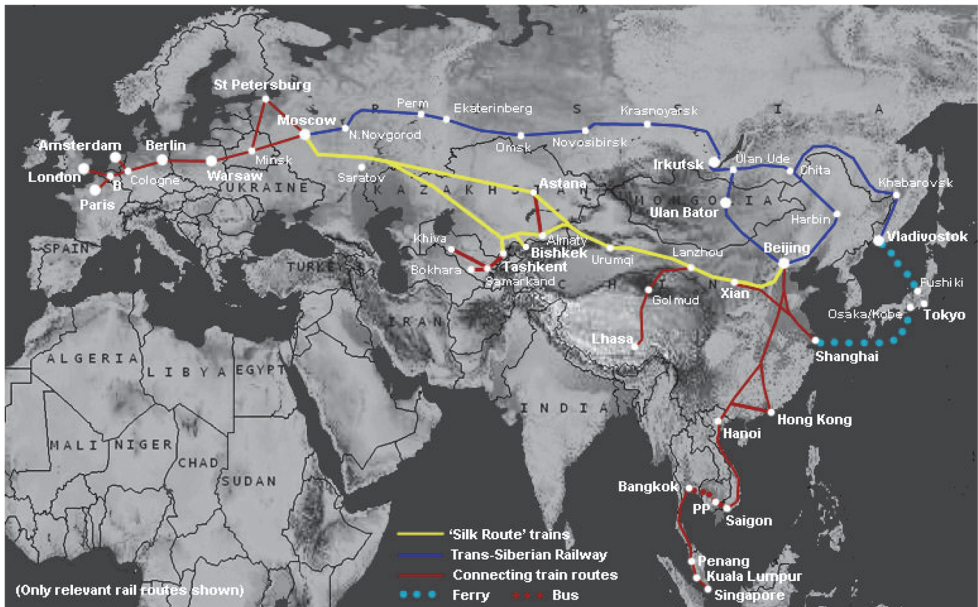


Fig. 36. The Silk Road project, including the Silk Road Economic Belt and the Maritime Silk Road



Source: [193]

Fig. 37. The main transport arteries within SREB space

The Chinese management promotes this project for the purpose of strengthening its geopolitical and geoeconomic positions on the basis of deepening and complex interaction with Eurasian countries. The concept is based on the principle of «mutual advantage and joint profit». Qu Xing, Director of the Chinese Institute of International Studies, stated the starting point of creation of the Silk Road Economic Belt as follows: «Against the background of globalization of economy all countries of the planet are mutually interested in each other – they enjoy joint prosperity and bear risks together; it is very difficult for a single country to develop independently of other countries of the world; therefore it is necessary to adhere to the principle of mutual advantage and joint profit» [quoted according to 150, page 32].

The Silk Road Economic Belt will develop along eight directions («sectors»): transport, energy, trade, agriculture, tourism, information and sci-tech cooperation, safety and political interaction. These «sectors» may be developed either simultaneously, or in turn, depending on maturing of conditions, activity and susceptibility of member countries. It should be noted that «special sectors» of SREB correspond to the main areas of cooperation within the SCO.

In recent years China became the leading trading partner of the SCO countries. It ranks first in the foreign trade turnover of Russia and Kazakhstan, second in that of Kyrgyzstan and Uzbekistan and third in that of Tajikistan.

Fast growth of the Chinese economic presence in the member countries became possible, first of all, thanks to the extension to the partners of target soft credits (at 2-5% per annum, with a five-year payment deferral) for specific projects. And today China is the leading creditor of the Central Asia countries and a large investor in their economy, mainly in the energy sector, mining industry and transport and energy infrastructure. By 2014 direct accumulated Chinese investments in the SCO countries exceeded \$25 billion, including \$18 billion in Kazakhstan, and \$4 billion in Russia [150].

One of the tasks of the Silk Road Economic Belt is to redirect the goods and capitals export flows to those countries which remained out of the routes of world trade earlier. First of all these are countries of Africa and Central Asia. It is with them than China has been developing cooperation in the last decade. Investments of Chinese companies became for these countries in fact the only chance to obtain investments and to keep a neutral status. However

the Chinese presence in these regions is not limited just to economy. The «Chinese threat» factor becomes the main obstacle for spreading Chinese economic influence. China tries to eliminate it through a so-called «soft power», a strategy of expansion of cultural influence of China, in particular by increasing the number of students from these countries which study in the Chinese higher education institutions.

The project also targets consolidation within the same space with China of some countries, which are geopolitical opponents of the USA and represent powerful political force: Russia, Iran and Pakistan.

Control over Silk Road routes will provide – as Chinese believe – energy security of the country. Currently China, being the largest importer of energy resources in the world, completely depends on sea deliveries and potentially is under the threat of «oil embargo» at the sea. Besides, the «Silk Road Economic Belt» project will allow the PRC to protect its investments in strategically important regions. Trade points controlled by Chinese state corporations may be used both in commercial, and anti-terrorist purposes. Mass media report about negotiations on building military bases «Pearl Thread» around India in the Indian Ocean.

The economic aspect shall be also kept in mind: for the PRC – a decrease in logistic costs; and for transit countries along the Silk Road route – attraction of investments to the region. At the regional level the main goal of the PRC is safety of the East, Central and Southeast Asia. It will determine not only the PRC's trade, but, first of all, safety of some border regions of China.

From the civilizational, cultural and historical point of view Russia refers Central Asia to the sphere of its interests. And the question of how the Silk Road Economic Belt will bear to such regional associations as the EAEU and the SCO, is not at all idle.

On May 8, 2015 in Moscow a «Joint Statement of the Russian Federation and the PRC on Cooperation in Integration of the Eurasian Economic Union and the «Silk Road Economic Belt» Projects» (Fig. 22) was signed. This statement represents, as a matter of fact, a political declaration: how to avoid a clash of the projects, which are vital for each country, in the territory of Central Asia. Ultimately, the countries intend to conclude an overall agreement on trade and economic cooperation between the EAEU and the «Silk Road Economic Belt». This process will last for many years: the regulatory base, the principles and the progress of implementation of infrastructure projects and many other things will be studied. However,

it must be kept in mind that the EAEU and the Silk Road project do not contradict each other, but are instead complementary. They are different in substance. The EAEU has a rigid institutional framework, and the Silk Road Economic Belt is a development concept rather than an integration project. But they have the same field of activity and similar purposes – ensuring a balanced economic and social development in Eurasia, free from all barriers and dividing lines.

«Joint statement» on future agreement of May 8, 2015 is also important for the following reasons. First, the EAEU integration project is potentially provided with much smaller investments, than the Silk Road Economic Belt. Secondly, Russia earlier had a similar agreement only with the European Union (the partnership and cooperation agreement of 1997). Initiating by the EAEU long-term «integration» negotiations with China may complicate the resumption of negotiations with the European Union for a new agreement. However, taking into account existing political realities between Russia and the EU, the question of such agreement with the European Union will hardly be topical in the nearest future.

At the same time there are two serious obstacles on the way of implementation of the Silk Road Economic Belt project. First, these are safety problems in China, primarily in the Xinjiang-Uigur autonomous region. Secondly, it is a contradiction between China's aspiration to cooperate actively with its neighbours and a trend to take more hard line in territorial disputes with some of them. Such position causes serious concerns in neighbouring states. As the Silk Road Economic Belt project proceeds, Beijing should rethink its approaches to the solution of these issues [195].

Meanwhile the implementation of large international projects is an essential task also for the solution of internal political tasks of the PRC. First, this is a profitable investment of capital with a high payback rate and considerable long-term benefit. Secondly, the Silk Road, passing through the Western China, will facilitate the solution of the problem of uneven development of the country, and promote economic and cultural integration of the western regions of the country. At last, the implementation of infrastructure projects will be a source of new jobs for Chinese state corporations.

However there is a natural question: and how these Chinese initiatives meet strategic interests of Russia? To answer it, good judgement, pragmatism and understanding of the Russian interest in this project are required.

It should be also realised that there are favourable conditions for taking a strategic decision on Russian participation; that a corridor of opportunities opens which will not remain vacant for a long time, waiting for Russia. But will Russia agree to play a back-seat role in this process?

At the same time it should be frankly admitted that for Russia and some other SCO member countries there are certain risks in implementation of the Chinese project. As it was already noted above, one of the purposes of SREB is acceleration of creation of free trade areas to provide for free exchange of goods, services and capitals between China and countries located on the main trade lines of the PRC. However full customs «disarmament» of the SCO members may create competitive advantages for cheaper Chinese products in their national markets. By the way, one of reasons of formation of the Customs Union of Belarus, Kazakhstan and Russia was counteraction to expansion of Chinese economic interests to the member countries where they compete with own interests of these countries [150].

Besides, we have to agree with the assessment of SREB-to-EAEU interfacing given at SPIEF-2016 by the President-Founder of the World Public Forum «Dialogue of Civilizations» V.I. Yakunin: «when we speak about integration projects, such as, for example, the «New Silk Road», and about interfacing the «New Silk Road» to the EAEU, we have to realize that the EAEU is a political and economic structure and the international organization, while the «New Silk Road» is quite a specific economic project, though with substantial political context. We have to offer something that is really interfaceable. The idea of the Trans-Eurasian Development Belt could become such a project interfaceable to the «New Silk Road»⁵⁹. We discussed this with Chinese, and in Kazakhstan. It seems to me that such approach will make it possible to take a new look at the development of not only infrastructure» [17].

Interests of the countries in this region intersect, and Russian economy is inferior to the Chinese. We have to be ready for long and delicate negotiations on all issues of interaction during implementation of the Silk Road Economic Belt project. From geopolitical point of view Russia is interested not in competition of various projects, but in creation of a developed infrastructure for the benefit of deepening energy cooperation and development of territories. An important role in embodiment of plans of interfacing the Eurasian Economic Union to the Silk Road Economic Belt

⁵⁹ For more details about this project see, e.g., [6].

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project is assigned to Kazakhstan. It is not a mere coincidence, apparently, that the Chinese President presented for the first time the «Silk Road Economic Belt» project in September, 2013 in Kazakhstan. After all several years ago the countries began actively discussing here a possibility of transformation of Kazakhstan into one of major international transport and transit nodes on the way from China to Western Europe countries (Fig. 38).

The geopolitical role of Kazakhstan as a transit bridge between Europe and Asia, as well as between the Russian Federation and China is determined by its location in the center of the Eurasian space. Being at the joint of Europe and Asia, Kazakhstan possesses a high transit potential, providing to the Asian countries a land transport route to Russia and Europe which virtually has no reasonable alternative from geographical point of view.

Three main transit routes pass through the territory of Kazakhstan:

1. Europe – China (with participation of Russia);
2. Europe – China (via Transcaucasia countries and Turkey);
3. Russia – Central Asia.



Source: <http://www.europe-china.kz/links>

Fig. 38. International Automobile Corridor «Western Europe – Western China»

The idea of creation of several transport corridors between Russia and Kazakhstan was discussed both in bilateral, and in multilateral format. As a result the project of laying of thoroughfares between the Western China and Western Europe was included in the lists of projects to the implementation of which the UN Economic and Social Commission for Asia and the Pacific joined. It is expected what the Central Asian region in the next 20-25 years will be the most important transport site on this route. This route will shorten the time of delivery of cargoes between Western Europe and China approximately 3.5 times as compared to the existing options.

Total length of the route is 8,445 km, including 2,233 km across the territory of Russia, 2,787 km across Kazakhstan, and 3,425 km across China. All the participants will be able to obtain economic benefits from implementation of the project:

Kazakhstan: attracting investments, creation of new logistic centers and fulfilment of its logistic potential. Expected 2.5 times growth of the volume of cargo transportation will considerably increase the income from transit, and will improve the employment rate.

Russia: Reduction of cost of transportation from St. Petersburg where most goods from Europe arrive for subsequent transit Asia-Pacific. This is also a source of income from transit services.

China: an additional route of delivery of Chinese goods to Europe, reduction of shipping costs and, as a result, increased competitiveness of Chinese goods in the European markets.

Uzbekistan will also benefit from this route: the extent of its participation in the international trade will increase. It will be able to become a large logistic center in the Central Asia and to service areas with a population of about 45 million people. Uzbekistan can also become a transshipment point for cargo flows from Turkmenistan, Afghanistan, Iran and to gain income from transit.

In this way, implementation of the «Western Europe – Western China» project may become a breakthrough for the whole Central Asia region, contributing to the involvement of a bigger number of countries into commercial intercourses, positively influencing the development of the transport infrastructure of the region and, in general, to the acceleration of the rates of development of economies of the Central Asia countries.

Completing the subject of the Silk Road Economic Belt project, we would like to recall the results of the Astana Economic Forum - 2016 where,

in particular, the outlooks of this project were discussed. In spite of the fact that the payback of the project of land cargo transportation from China to Europe still waits for serious economic substantiations and calculations, the competition for the selection of specific routes has already aggravated. The forum which took place in Astana late May, 2016 demonstrated it.

As the then prime minister of Kazakhstan, Karim Masimov, stated at the forum, «Silk Road Economic Belt» has to promote diversification of economies of the countries of the region [196]. However the countries of the region suggest different methods and ways of integration. Kazakhstan gives priority to construction of Beyneu – Bosa – Shymkent gas pipeline (this project envisages yearly supply of 10 billion cu. m. of gas to China), as well as of the transit highway Western Europe – Western China (the Kazakhstan section is almost completed, the time of deliveries may be reduced to 10 days against current 45 days by sea). Tajikistan suggests alternative routes: gas supply to China from Turkmenistan and construction of roads from Iran to the PRC. Singapore insists on development of sea carriage and financial integration of countries adjacent to the Silk Road. The members of the governments of Estonia and Latvia who spoke at the Astana forum offered goods transfer services. D. Pankin, the head of the Eurasian Development Bank, reported that so far, according to the bank estimates, the price of overland transportation as compared to the sea carriage is «order of magnitude greater» [196].

The issues relating to the implementation of the Silk Road Economic Belt project are actually discussed only by China and the EAEU so far. The SCO also supports the Chinese project, which was confirmed by the Secretary General of the organization, D. Mezentsev, at the Economic Forum of the SCO countries in June, 2014 in Bishkek. Chinese President Xi Jinping also spoke about outlooks of formation of a uniform space based on the SCO and the EAEU.

In general China assigns to the Shanghai Cooperation Organization an important role in the solution of the region problems in areas of interest of China. The SCO became for China a mechanism for ensuring safety, building close political contacts with the Central Asia countries and, in particular, implementing own energy supply strategy in the region [197].

So, the Chinese management strives to use the whole range of economic and political tools to realise its national energy security strategy. Simultaneously, this contributes to the implementation one of five points

of the «Silk Road Economic Belt» strategic concept aimed at solution of the civilization task: general aspiration of people to improvement of friendly relations, deepening of mutual understanding, solution of social problems, humanitarian communication.

7.3. Challenges of energy supply of the country and its energy policy

China reacts quite clearly to the geopolitical situation as a factor influencing energy security of the country. However, it does not prevent it to build its energy strategy according to the existing model of internal consumption structure.

The energy policy (energy strategy) is considered by the Chinese management as one of conditions of stability of economic development. The main contradiction in the Chinese energy policy is between limited internal opportunities of production of energy resources and potential for increasing their import. The situation is aggravated by a critical environmental situation. In fact, China became a hostage of relatively cheap energy carrier – coal.

China's leaders give priority to energy problems and development of an adequate energy strategy of the country. This is confirmed in particular by the creation of the State Energy Commission, Special State Office for Oil Reserves, Energy Administration as a part of the State Committee for Development and Reforms, as well as formation by various concerned departments of the State Task Force for the development of energy strategy.

In particular, the mission of the State Energy Commission includes generation of the national energy industry development strategy, consideration of important issues relating to the energy security and development of the energy industry, comprehensive planning and coordination of activities associated with the development of energy sources in the country and international cooperation in the energy area, as well as ensuring China's access to hydrocarbon sources abroad. The Commission also became the key decision making center in the field of energy diplomacy [198].

The main priorities of the energy policy of China follow from the State five-year plans and their constituent documents (fuel and energy complex development programs by branches). Besides, they are stated in the «Medium-Term and Long-Term Energy Policy Program (2005 to 2020)»

and «Medium-Term and Long-Term Nuclear Energy Development Program (2005-2020)» published in 2005, and the «Medium-Term And Long-Term Renewable Energy Development Program» published in 2007.

Proceeding from the existing and predicted threats in the field of energy, the State Council of the PRC approved in 2004 the «Long-Term Energy Development Plan» for 20 years. The plan contains five main strategic objectives:

- development of energy resources;
- optimization of energy structure;
- ensuring energy security;
- resource saving;
- environmental protection [192].

Strategic issues of the energy policy of China in the field of development of the national energy complex include [199]:

- Increasing capital investments in exploration, development and processing of own oil and gas deposits. The Chinese government set a course on revaluation of hydrocarbon reserves in the country, as well as increasing oil and gas production, in particular offshore.
- Optimization of the fuel and energy balance of the country.
- Implementation of measures aimed at energy saving and increasing fuel and energy utilization efficiency
- An intensive development of nuclear energy, renewable and secondary energy sources.
- Creation of strategic reserves. Construction of the first strategic oil reserve storages was started in 2004 in Liaoning, Shandong and Zhejiang provinces.

Energy strategy of China envisages not only import of raw materials, but also an active participation of the national capital in exploration and development of oil fields abroad. It is the so-called strategy of «moving outwards»⁶⁰. It is aimed at motivation of large Chinese state companies to purchase assets and to expand their activity abroad, in particular, to ensuring deliveries of raw materials to the PRC. But not only this. Chinese

⁶⁰ The strategy of an active access of Chinese producers to foreign markets under the motto «moving outwards» was declared for the first time in 1997. The ultimate goal of the strategy was to transform the PRC in 2020-2030 in the major economic power of the world and to increase in 2020 the GDP four times. The strategy was based on some theses, the main of which were: «using benefits of two (external and internal) markets and two (internal and external) raw materials sources and obtaining thereby more ample opportunities for improvement of the economic structure and optimization of expenses».

companies sign agreements for joint development and ownership of fields. In this way China wants to insure itself against sharp jumps in prices in the world markets and to diversify sources of energy resources.

High dependence of China on import of energy resources, especially oil, caused the necessity of development of the External Energy Strategy of the PRC. Leading Chinese researchers in the field of energy believe that the Chinese external energy strategy relies on two principles: the first being international cooperation, and the second, comprehensiveness. The first principle is understood as prevention of conflict situations between China and the exporting country. For this purpose, the relations shall be built only on terms of mutual advantage. Comprehensiveness, according to the experts of the Academy of Social Sciences of the PRC, consists in establishing business relations with many independent sources of import of energy resources located in Africa, America and Asia. Comprehensiveness also includes measures for diversification of transportation of energy resources, assuming simultaneous development of maritime and land carriage, laying oil and gas pipelines [199].

In 2007 the State Council of the PRC published the first White Paper on Energy under the name China's Energy Conditions and Policies. The country leaders formulated there basic principles of energy policy of China for the coming years [200, 201]:

- Giving priority to thrift. The PRC considers preserving of resources as a basis of the state policy. For this purpose plans have been elaborated for stimulation of respective scientific researches and development of energy-saving technologies, improvement of the energy saving legislation and standards, energy efficiency growth, etc.
- Relying on domestic resources. In meeting the growing demand for energy, the country has to rely first of all on its own opportunities and resources.
- Encouraging diverse patterns of development. It is necessary to continue to develop national coal resources, to stimulate the development of energy industry, to accelerate oil and gas natural exploration, to stimulate shale gas production, the development of hydraulic power industry and other RES, to develop actively nuclear energy, etc.
- Protecting the environment. The PRC's purpose in this area is to build a resource-saving, environmentally friendly society, coordinated

development of the energy industry and environmental protection in the interests of sustainable development.

- Cooperation for mutual benefit. The PRC shall cooperate with international energy organizations and other countries for the purpose of preserving international energy security and stability openly and pragmatically on principles of equality and mutual benefit.

By 2010 China stated the main objectives of domestic and foreign energy policy which remain topical to the present day.

The main objectives of the domestic energy policy include [198]:

- diversification of energy sources and methods of its production;
- increase in investments into oil and gas exploration, production and refining;
- improving energy use efficiency;
- using new energy sources;
- ensuring environmental protection;
- development of environmentally safe use and high-quality processing of coal;
- creation of a strategic oil reserve;
- building the national oil and gas transportation system.

In recent years these objectives have been complemented by the control of demand for energy resources in the country in order to decrease its dependence on foreign exporting countries [202] and price policy reforming, including gas and electric energy prices [203].

The main objectives of foreign energy policy also include diversification of energy cooperation and search of new markets; safety of transportation of import energy resources; attraction of foreign investments into development of Chinese energy industry; cooperation with other countries in creation and implementation of advanced energy technologies; diversification of imported types of energy carriers, etc.

On October 24, 2012 the press office of the State Council of the PRC published the second White Paper - China's Energy Policy 2012. It contained the statement of the essence of the energy policy of China: «giving priority to thrift, relying on domestic resources, encouraging diverse patterns of development, protecting the environment, scientific and technology innovations, deepening reforms, expanding international cooperation and improving life of people». The state will aim to promote transformation of its energy production and energy use pattern, and to build

a modern industrial energy system meeting the principles of safety, stability, efficiency and environmentally friendly development to support sustainable economic and social development with sustained development of energy industry [202].

Under new economic conditions energy companies of China constantly face new challenges and new production reality. Therefore the domestic and foreign energy policy is being updated almost continuously. In November, 2014 the State Council of the PRC issued the «Energy Industry Development Strategy (2014-2020)», and on May 19, 2015, a document entitled «Chinese Production 2025». These documents consider in detail, set strategic vectors, and specific development objectives in all areas concerning energy security, environmentally friendly use of energy resources, structural reform of the energy system. They are paramount program documents of the 13th five-year period containing tasks that the state sets for energy companies [204].

Dependence on external supply of hydrocarbons and dominance of coal in energy production (70%) are the most serious structural problems of the Chinese energy industry. Oil share is 20-21%, and gas share – only 2.9%. China imports natural resources from more than forty countries. The main suppliers are the Middle East and African countries: Saudi Arabia (16% in 2014) and Angola (13%) of total amount of oil imported by the PRC. Russian supplies start playing more and more significant role in Chinese oil import⁶¹ [205]. According to the Wall Street Journal forecasts, China dependence on oil import in 2020 will reach 70% (more than 560 million tons) against 54% in 2010.

However, already in 2015 China dependence on oil import reached 60.6% (as compared to 32% in 2000, 41% in 2005, and 55% in 2010). According to the forecasts of the Institute of Economic Researches of China National Petroleum Corporation (CNPC) which on January 26, 2016 issued the «Report on Development of Domestic and International Oil and Gas

⁶¹ In 2013 Rosneft and Chinese oil company CNPC signed a \$270 billion contract. According to the contract Rosneft will supply to China for 25 years 360 million tons of oil [205]. In the spring of 2016 Russia became the largest oil exporter to China, sidelining Saudi Arabia. In May the volume of Russian deliveries reached 5.25 million tons, increasing by a third as compared to the same period of the last year. However already in June they fell by 21%. Russian oil, according to the statistics of the Central Customs Authority of PRC, was replaced by supplies from Saudi Arabia, Angola and Iran. In July Angola became the leader in oil supply to China, Saudi Arabia ranked second, and Russia – third. In October China bought 4.74 million tons of Russian oil, and in November – 4.6 million tons or 1.12 mb/d (about 22% of total export). Saudi Arabia (4.57 million tons) came out on top again [206-208].

Industry in 2015», in 2016 dependence on foreign oil would grow to 62% [209]. However already in the first half of 2016, according to the National Commission for Development and Reforms of the PRC, China's dependence on oil import reached record 64% due to the growth of import by 14.2% as compared to the same period of the last year. Domestic oil production for the period under consideration decreased by 4.8% as energy companies preferred to increase import in order to benefit from low world oil prices. A long period of low oil prices also made oil production for Chinese companies less cost-effective [210].

According to CNPC, based on results of 2016, China's dependence on imported oil reached 65% (the last year oil consumption in the country increased by 2.8% and reached 556 million tons from which only about 200 million tons were produced in the PRC). «In 2017 import oil consumption growth rates in China will gradually increase, and it is quite possible that the degree of dependence on foreign hydrocarbons will be still higher,» Jiang Xuefeng, Deputy Director of the Institute of Economic Research of CNPC, noted in conversation with journalists [211].

Statistics also registered a considerable dependence of China from natural gas import which amounted to 32.2% in 2014, and more than 35% in the middle of 2016. In the first half of 2016 natural gas production in China grew by 2.9% as compared to the same period of 2015, and import increased by 21.2% [212].

To mitigate the risks of such dependence, China actively develops bilateral and multilateral energy cooperation, in particular with various international organizations and integration associations. The main of them are: the Asia-Pacific Economic Cooperation (APEC), the International Energy Forum (IEF), Energy Cooperation of the Association of South-East Asian Nations (ASEAN) + China, Energy dialogue between China and the EU, Energy cooperation between China and OPEC, Energy cooperation between China and the Cooperation Council for the Arab States of the Gulf (CCASG), the Energy Working Group of the SCO, the International Atomic Energy Agency (IAEA), the WTO, etc. Participation in such organizations gives a chance to various countries including China, to carry on an equitable dialogue, to discuss energy security issues, to strengthen cooperation, to contribute to joint development [198].

Implementation of the above-mentioned Silk Road Economic Belt is among the most important priorities of foreign energy policy in recent years.

7.4. China and Asian Energy Super-Ring

Along with the Silk Road Economic Belt project the Eastern Energy Ring, or the Asian Energy Super-Ring project also worth mentioning. It should be also considered in the interciviliation context. This project was in fact launched at the Eastern Economic Forum in September, 2016. The president of Russia V. V. Putin declared at the Forum: «We support the initiative of Russian, Japanese, Korean and Chinese companies to create the energy super-ring which will connect our countries ... In this context ... Russia is ready to offer to our partners competitive in Asia-Pacific price for electricity and to freeze it for a long-term period» [213].

Alexander Novak, the Minister of Energy of the Russian Federation spoke at the Forum about high potential of increase in energy consumption in the Asia-Pacific: «The region consumes 42% of all energy in the world though 60% of total population of the planet live there» [214]. And this creates premises for the development of joint projects in the energy industry which will connect Russia with its Far East neighbours⁶².

⁶² Historical background. The energy ring concept has been existing for many decades. The idea of the project of integration of electrical energy systems of the East of Russia, China, Mongolia, South Korea and Japan goes back to the 1990s. It was scientifically justified in works of the Siberian Energy Institute of the Siberian Branch of the Russian Academy of Science (currently – Melentiev Energy Systems Institute of the Siberian Branch of the Russian Academy of Sciences). Originally the project contemplated connection of the integrated energy grid of Russia with Northeast Asia countries through a system of flexible DC inserts in the eastern part of the Russian Federation with energy supply systems of China, the Korean peninsula countries and, in the long run, Japan. Russia played therein a key role – because of decrease in energy consumption caused by reduction of industrial production, the country has excesses of electricity which could be sold to the eastern neighbours. Siberian hydroelectric power stations had to become the main donors of the «ring». Another role that Russia could play – that of key «intersection» for day and seasonal energy overflow between the countries especially as energy consumption peaks in different countries fall on different seasons (in Russia and northern China – it is winter and spring, and in Japan and in the south of China – summer). Other Asia-Pacific countries also could take part in this project [215]. In 1998-2000 it was actively promoted by RAO UES of Russia. At that time the concept consisted in integrating energy supply systems of Russia, China, Mongolia, the Republic of Korea and Japan for the purpose of large-scale export of electric energy and application of the intersystem effect for optimization of use of generating capacities, considering that peak loads in different regions are spaced in time. The project was tentatively estimated at \$6.5 billion. The development of the feasibility report was authorized, but then the work was suspended. The countries returned to the project after the accident at Fukushima-1 NPP in March, 2011. As a result of shut-down of nuclear power plants in Japan the country lost about 30% of its generating capacities [214].

Today export ties of Russia with Asia-Pacific countries in the field of energy industry are quite weak. Energy is supplied neither to Japan, nor to the Republic of Korea. To China energy is exported through three lines: 10 kV Blagoveshchenskaya-Heykhe line, 220 kV Blagoveshchenskaya-Aygun line and 500 kV of Amurskaya-Heykhe line. A contract signed in 2012 provides for the deliveries to the North China of not less than 100 billion kW·h for 25 years. There are projects on expansion of export relations with China. Electric energy is also delivered to Mongolia, however, in insignificant amounts (about 285 million kW·h).

The results of a joint survey of Skolkovo Institute of Science and Technology (SkolTech) and Melentiev Energy Systems Institute of the Siberian Branch of the Russian Academy of Science (RAS) demonstrate that the concept of coupling energy supply systems of the Northeast Asia countries has a high potential: the volume of overflows between member countries of the project may reach 400 TW·h per year. And maximum efficiency may be obtained thanks to system effects rather than bilateral cooperation.

In parallel under the auspices of the Energy Charter Secretariat, the experts of the Energy Systems Institute of the Siberian Branch of the RAS, Japan Renewable Energy Foundation – JREF, Energy Economics Institute of the Republic of Korea – KEEI and the Ministry of Energy of Mongolia – within the framework of the joint survey «Gobitec and the Asian Super Grid» – assessed the outlooks of the Asian Energy Super-Ring under current conditions. It should be noted that the idea of the ring underwent one essential change – its framework was expanded by inclusion of the Gobitec project involving construction of powerful wind and solar power stations in desert areas of Gobi (Fig. 40).

According to the National laboratory of renewable energy sources of the Ministry of Energy of the USA, the potential of RES of this region is 2600 TW·h per year, 1500 TW·h of which may be generated by sun, 1100 TW·h, by wind. Technical potential is slightly less, nevertheless, it is sufficient to justify construction within Gobitec project of huge wind and solar power stations with total capacity of 100 GW. Besides, the shortest route of energy lines connecting Eastern Siberia and northeast provinces of China lies here. Potential contribution of Russia is estimated 10 times less, about 10 GW of energy of HPPs. Thus, Russia, as well as Mongolia, will be an exporting country. But the main thing is not even net export of electric energy, but



Source: Thematic appendix to Kommersant newspaper of 17.10.2016, No. 33 [215]

Fig. 39. Eastern Energy Ring – the Asian Energy Super-Ring



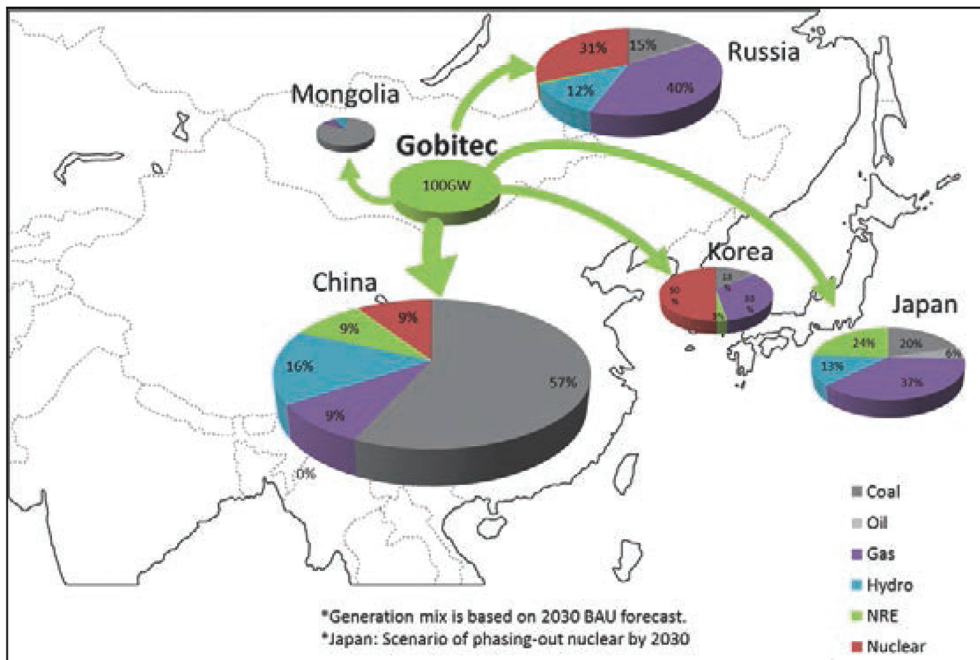
Source: Energy Charter Secretariat [216]

Fig. 40. Asian energy ring from the point of view of Gobitec project

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an opportunity to transfer seasonal or day excesses of energy generated in various parts of the «super-ring» to those regions where they are most demanded at that time, which in its turn will make it possible to optimize the structure of generating capacities in member countries of the project (Fig. 41).

To transmit such amounts of energy and power, superhigh-voltage DC lines are the most suitable: power transmission lines with a voltage exceeding 1000 kV⁶³. The cost of the project may reach about \$294.6 billion, including \$237.9 billion for construction of solar and wind stations, \$56.7 billion for construction of the networks [217].



Source: Energy Charter Secretariat [216]

Fig. 41. Forecasted structure of generating capacities in 2030 and «green» electric energy transfers after implementation of the Gobitec project

⁶³ As Yueming Chen, Executive Vice-President of the State Grid Corporation of China reported at SPIEF-2015, within the framework of One Belt, One Way project China is going to build an ultrahigh tension power transmission line (800 kV DC and 1000 kV AC) with neighbouring countries, such as Russia, Kazakhstan, Mongolia and Pakistan [219].

It should be noted that these projects were also extensively discussed both at the SPIEF-2015 session «Energy Integration of Europe, Russia and Asia–Boundless Opportunities» [219], and at the XII Krasnoyarsk Economic Forum (March, 2015) where it was noted in particular that the «super-ring» project faces some serious problems of not only economic nature. One of them is different standards, specifications and regulations relating to the operation of electric networks in Russia and the Northeast Asia countries. The second is legislative distinctions of different countries. The third problem has a political character: member countries different in terms of the form of government and approaches to the relationship with neighbours are concerned about national energy security in case of consolidation of their electric grids [215, 218]. Nevertheless, participants in the Krasnoyarsk Economic Forum concluded that current difficult foreign policy situation does not cancel the possibility of implementation the Asian Energy Super-Ring project. And, most likely, it will be embodied in the next decade [218].

7.5. China and Paris Climate Agreement

Signing by China of the Climate Agreement reached in Paris on December 12, 2015 during the 21st Conference held within the framework of the United Nations Framework Convention on Climate Change (COP21) set for the country a huge task of considerable reduction of emissions of CO₂ and other greenhouse gases in historically short terms.

Already at preparation for the Paris conference China, as well as other developed countries, G20 members, assumed voluntary obligations for decreasing greenhouse gas emissions (so-called INDC⁶⁴) the essence of which is in particular as follows [220]:

- to reach a peak of CO₂ emissions by 2030 (making every effort to achieve peak emissions before the said term);
- to reduce carbon intensity of GDP by 60–65% as compared to 2005;
- to increase the share of non-fossil fuels in the consumption structure of primary energy resources approximately to 20%.

⁶⁴ INDC (Intended Nationally Determined Contributions) mean statements of the parties with indication of actions which each national government intends to undertake according to the future climate change agreement under the UNFCCC, negotiations on conclusion of which were held in Paris in December, 2015. INDC are actually a basis of obligations for reduction of global emissions for the period after 2020.

According to these obligations China should reduce by 2030 the amount of greenhouse gas emissions, in terms of CO₂, by 12,8 to 14,0 billion tons.

The solution of this ambitious task implies both the reduction of the general energy intensity of the Chinese economy, and the transition of the country from mainly coal energy industry to the energy industry using more ecologically safe sources. The PRC intends to perform this transition through the development of nuclear energy, RES energy and the use of national resource of nonconventional natural gas sources.

In each of these areas a systematic large-scale work has been conducted.

So, in order to cut down energy intensity of the economy, only for the last three years a lot of backward production facilities were liquidated, including steel and cast iron making facilities with a capacity of more than 90 million tons, cement production facilities with a capacity of 230 million tons, sheet glass production facilities with a capacity of more than 3.8 million tons, electrolytic aluminium production facilities with a capacity of more than 1 million tons. At the same time services sector developed at accelerated rates. As a result during the 12th five-year period (2011-2015) energy intensity of GDP decreased by 18.2%, in particular only in 2015 – by 5.6% [221].

According to the program of doing away with mainly coal-based energy industry, it is planned to reduce coal production, «to freeze» new coal projects, to close obsolete enterprises of the industry⁶⁵. So, according to Xinhua agency the government of the country recommended to close in the next three years 4300 mines with total production capacity of about 700 million tons of coal per year [222]. Nevertheless, coal remains the main source of primary energy in the country for the whole period till 2040 [223] especially as country leaders called the use of highly efficient «pure» coal technologies one of development priorities in the 13th five-year period [221].

As part of development of renewable energy (RES), China focuses on construction of hydraulic, wind and solar power stations. The estimates of the International Renewable Energy Agency (IRENA) show that the share of RES in total energy consumption of the PRC by 2030 can reach 26% [224].

Along with RES, the nuclear energy also develops at fast rates in the country, and in the next decades the country will be among leaders of

⁶⁵ In September, 2013 the Chinese government developed ambitious ecological tasks meant to reduce, in particular, coal consumption in the Beijing-Tyantszin-Hebei region by 85 million tons by 2017. And by 2020 coal share in the energy balance of China had to be reduced to 56% as compared to expected 63% in 2015 [226].

nuclear power generation. So, the 13th five-year plan stipulates an increase in capacities of existing nuclear units to 58 GW and beginning of construction of new NPPs with total capacity of 30 GW. By estimates of IEA, by 2040 China will account for about 50% of all world production of electric energy at NPPs (as compared to 4.5% in 2013 and 5.2% in 2014) [46, 225].

Measures aimed at decreasing greenhouse gas emissions and improving ecological situation in the country also include development of gas consumption and national production of natural gas. Despite a slowdown of gas demand growth in recent years⁶⁶, by 2020, according to the published priorities of development of the industry for the 13th five-year period (2016-2020), gas consumption has to grow at least to 237 billion cu.m., that is by 45 billion cu.m. in five years⁶⁷.

Proceeding from the available resource base, the PRC carries out extensive works to increase as much as possible production of gas from nonconventional sources⁶⁸:

- dense formations and low-permeability collectors («shale» gas);
- coalbed methane;
- syngas;
- gas hydrates.

Without touching upon the whole set of issues relating to gas hydrates, the more so, as they have been sufficiently covered in publications, we would like to note only that the success of development of gas production from gas hydrates in China will depend to a great extent on major uncertainty factors pertaining to future dynamics of gas consumption in the Northeast Asia countries [228]. They include, in particular:

- world prices for hydrocarbon raw materials and costs of oil and gas production both from conventional, and nonconventional sources, as well as the price-to-cost ratio;
- business environment and rates of growth/falling of economic development of these countries, as well as the world economy in general;
- technology progress in the area of use of renewable energy sources (RES) and improvement of energy efficiency;

⁶⁶ The reasons of such process are analysed by us in [227].

⁶⁷ The 13th five-year plan approved by the IV session of the 12th National People's Congress underlies basic principles, as well as the main priorities of social and economic development of the PRC. The respective detailed industry plans (in particular, for energy, gas industry, etc.) will be published, as expected, not earlier than the second half of 2017.

⁶⁸ In more detail about progress of works in China in the first three areas see [203, 227].

- general energy demand/offer ratio;
- economy decarbonization rates and low-carbon energy status, as well as the rules of implementation of the UN Paris Climate Agreement that have to be developed in 2016-2018. (Rules of the Sustainable Development Mechanism; Rules regarding forests; Reporting Rules, etc.).

It should be also noted that Chinese experts and politicians realise that commercially efficient development of gas hydrate deposits is not a matter of tomorrow. Yes, China became one of the few countries which mastered the required key technologies for exploration and production of gas hydrates, but the respective works in the country began relatively late therefore many technologies are still lacking. Besides, the general technological level of China is still lower than in many other countries. Moreover, problems relating to ecological and industrial safety of development of hydrates⁶⁹ are not resolved yet, and not only in China, and Chinese experts also understand this.

However, in any way these resources are rather important and may become a powerful contribution both to the ensuring energy security of the country, and to the fulfillment by China of obligations assumed within the framework of Paris Climate Agreement, though in the forthcoming years gas hydrates are not capable of replacing coal or natural gas in the energy balance of the country.

⁶⁹ For more details about these problems and possible ways of their solution see, e.g., [26].

8. RUSSIA AND CENTRAL ASIA

We have already mentioned the place of Central Asia in the Russian geopolitics in coordination with interests of (mainly) China and (partly) the USA. However, it seems appropriate dwell on this issue more in detail, in particular in relation to the energy infrastructure problematics.

For Russia stability in the Central Asian countries is vital both from the point of view of safety, and as a condition of interregional trade and economic development.

This region is rich with hydrocarbons and other minerals. Its resources include 3 billion tons of oil, 7 trillion cu.m. of gas, 40 billion tons of coal, 685 thousand tons of uranium. The countries of the region have a branched system of pipelines, a network of motor roads and railroads [192].

The fact that both from historical and civilization point of view (culture, language, etc.) this region is connected with Russia is also important. Therefore the top-priority place that Central Asia takes in the Eurasian integration projects initiated by Russia, first of all in the Eurasian Economic Union (EAEU), as well as in the Chinese Silk Road Economic Belt project is quite explainable. The vector of formation of the Common Economic Space inherent to these projects provides ample opportunities for harmonization of efforts of its participants. At the same time new «bricks» in the construction of the common European civilization Home are laid here.

Central Asia is in the focus of changes of orientation of dynamic flows between the main potential participants of their formation: North (Russia) and South (Southern Asia); East (China and Middle East) and West (Europe). Thus, without possessing significant – as compared to the global scale – economic and even natural and resource potential, this region became an object of competitive struggle for influence on the part of China, Russia and the USA.

The geographical position forces the Central Asian countries to look for outlets to seaports, directing the vector of trade and investment relations to the North and/or South. Therefore the investment attraction structure reflects certain misbalance in political relationships, in particular with strategic partners. Russia and China prevail in the structure of foreign trade and external investments into economy of these countries. Though capitals from Great Britain and the USA are also present. Iranian investments

are present in the economy of Turkmenistan and Tajikistan, Turkish investments – in Kyrgyzstan and Turkmenistan. At that, major part of external investments into economy of the Central Asia countries is directed to the spheres of energy and natural resources. These are hydrocarbons in Kazakhstan, Uzbekistan, Turkmenistan, hydraulic power resources in Tajikistan and Kyrgyzstan.

Serious infrastructural problems in Central Asia are connected with hydraulic energy and water supply.

Water resources of Central Asia include four catchment areas: The Caspian Sea, the Ob River, Lake Balkhash and the Aral Sea (basins of two main rivers – Amu-Darya and Syr-Darya). The first three catchment areas are in Kazakhstan, and the fourth stretches for the territories of all countries of the region.

Hydrographic particularities:

- a. irregularity of distribution of water resources, which are mainly concentrated in Tajikistan and Kyrgyzstan. Turkmenistan and Uzbekistan has very scanty water supplies;
- b. there are a lot of cross-border rivers in the region crossing borders of two and more states (Amu-Darya, Syr-Darya, Chu, Talas, Ili, Tarim and Irtysh). Currently, main conflicts concerning water resources are associated with construction of large hydroelectric power stations on Amu-Darya and Syr-Darya tributaries.

Most sharp water use problems emerge when waterways flow across the territory of several states. Countries where upper courses of rivers are located, are in position of monopolists capable of regulating water discharge at their own discretion, uptaking it for the needs of agriculture and industry, building hydraulic engineering structures, etc. This brings about an aggravation of interstate conflicts.

From the point of view of distribution of water resources all five countries of the Central Asia may be divided into two groups:

- a. countries with insufficient water resources – Kazakhstan, Uzbekistan, Turkmenistan. They are interested in the use of river runoff of irrigation;
- b. countries rich with water resources – Kyrgyzstan and Tajikistan. They are more interested in hydrotechnical use of rivers.



Source: World bank [229]

Fig. 42. Water resources of the Aral Sea basin.

Energy priorities of countries located in the upper course of rivers contradict agricultural interests of countries located in the lower reaches: the first need primarily electric energy, and the second – water for irrigation farming. As a result one may observe more and more deepening rupture of energy ties and an increase of water contradictions with mutual reproaches and claims. According to the UN, because of inconsistency of solutions in the field of coordination of water issues the Central Asia loses annually not less than \$1.75 billion.

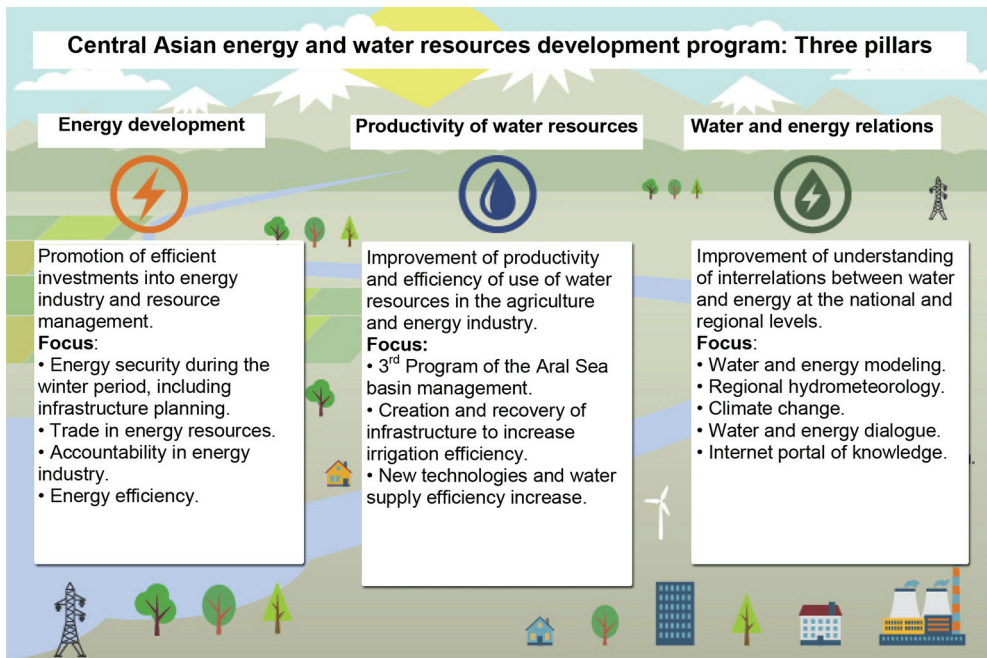
A rational and mutually advantageous use of hydro-electric resources of the Central Asia countries, including development of infrastructural ties, may be reached subject to an agreed hydro-electric strategy. And not only strategy. A new economic mechanism of joint comprehensive use of hydro-electric resources shall be developed. In general, in matters of joint

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use of such resources much more important are safety and mutual benefit reached through interdependence of the countries, rather than declarations of independence and sovereignty.

The world community has a wealth of experience in the field of interstate regulation of such problems: there are more than 50 interstate agreements in this respect. For example, the USA pays for Canada services relating to the regulation of the runoff of the river Colombia by means of the Canadian cascade of water reservoirs. In relation to the Central Asia, scientifically grounded calculations for determination of cost of such services can be also developed and formalised in intergovernmental agreements. In particular, countries needing irrigational water in summer shall be provided with guarantees of its supply.

World community concern about the problem of energy and water resources in Central Asia was expressed, in particular, in the Central Asia Energy-Water Development Program (CAEWDP) prepared by the World Bank in 2010 (Fig. 43).



Source: World Bank, 02.04.2015

Fig. 43. Central Asia Energy-Water Development Program

The World Bank recognizes that rational use of water resources for irrigation and energy generation is vital for sustainable development of all Central Asia countries. The World Bank provides support in the field of energy and water resources in the Central Asia both on regional, and national level.

It is obvious that Russia also cannot stand away from the solution of the mentioned problems. Especially as it has not only economic interest here. Both ecological, and social aspects are important for Russia. Disturbance of ecological balance in Central Asia due to Aral drying results in climatic anomalies in Russia as well. Besides, Russia as, perhaps, any other country, is interested in stability in the region. It does not need any conflicts including those because of water resources.

Besides, under conditions of western sanctions agricultural products from the Central Asia countries could find additional markets in Russia. As a compensation for deliveries of agricultural products Russia, for example, could supply to Tajikistan and Kyrgyzstan electric energy when they lack it in winter, delivering it through the energy supply systems of Kazakhstan.

Russia could also participate on a shared basis in provision of the region with drinking water. After all southern areas of Russia also experience water shortage. South Ural regions – that of Sverdlovsk, Tyumen, Orenburg, Chelyabinsk, Kurgan – would benefit from the transfer of a part of river runoff to this region. The idea is not to fill the Aral Sea, but to supply drinking water to the Central Asia. Then less water will be diverted from Syr-Darya.

To solve water and energy problems of the Central Asia, the feasibility of transfer of free resources of Siberian rivers to this region may be also considered. We are not talking here about notorious «turning of the Siberian rivers», but only about possible partial use of these resources for irrigated agriculture in semidesert regions of the Central Asia.

Integration of the hydropower complex of Siberia, Tien Shan and Pamir could allow Kyrgyzstan and Tajikistan not to develop their own hydroelectric power stations, infringing upon water management interests of Uzbekistan, Kazakhstan and Turkmenistan. The Central Asian rivers could be more oriented to the irrigation needs of all regions, and electrical energy could be supplied from Siberian hydroelectric power stations with subsequent continuation of high-voltage power transmission lines through Central Asia to the regions of Pakistan, India and southeast China here, closing thereby the southern branch of the Eurasian energy system.

Therefore, in spite of complexity and versatility of the problem of use of water resources of cross-border water currents it nevertheless may be solved provided the parties concerned use an integrated approach. In doing so, the countries shall give priority to the taking of binding decisions at the interstate level, in particular using the potential of the Shanghai Cooperation Organization.

Speaking hereinbefore about creation of an infrastructure connecting the Central and the Southern Asia through Afghanistan and liberalization of the regional trade, we mentioned a project of construction of a high-voltage power transmission line from Kyrgyzstan and Tajikistan to Pakistan through the territory of Afghanistan – CASA-1000 (Fig. 44).

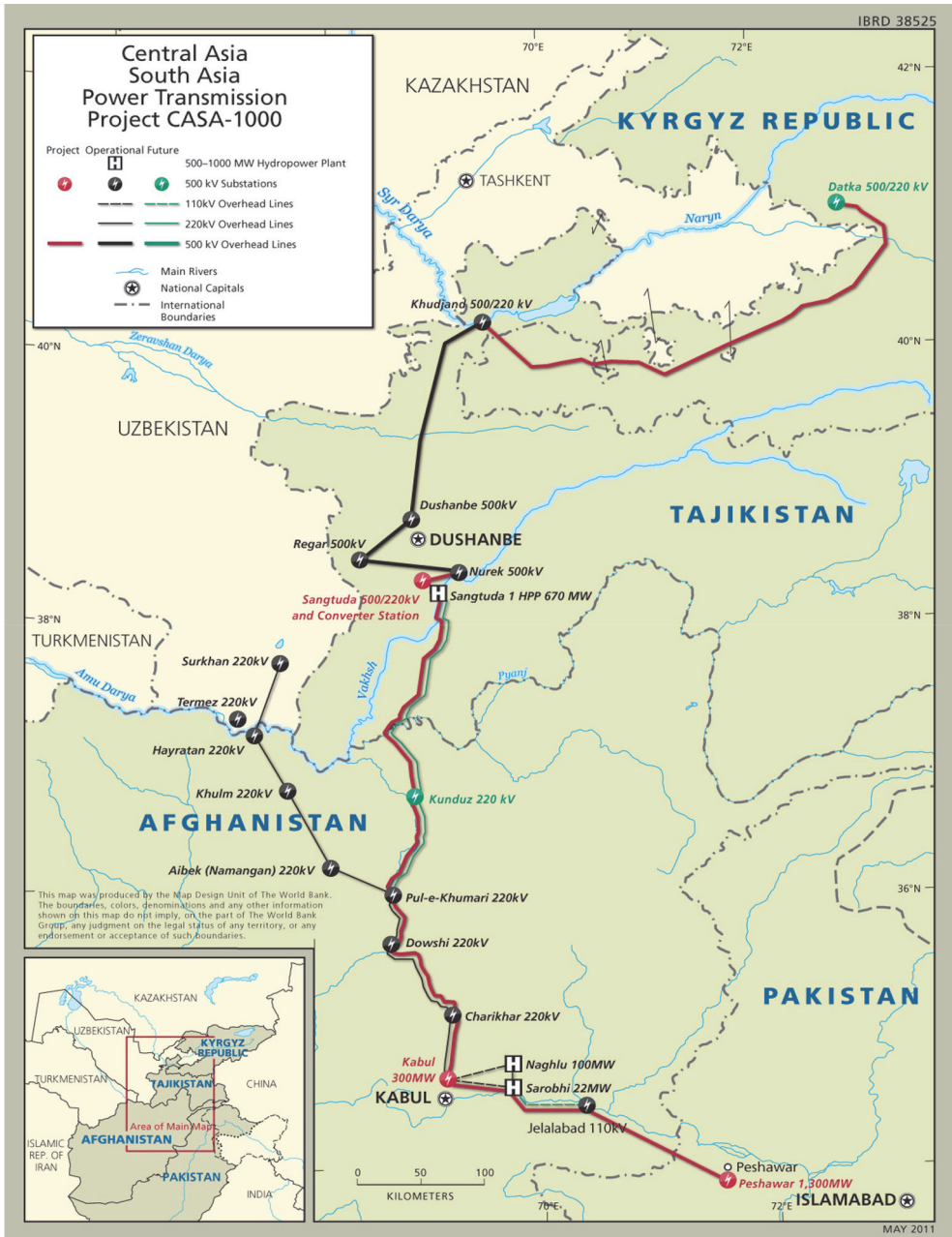
This is an infrastructural project of regional trade in electric energy between the Central and Southern Asia countries. It is included into the World Bank program implemented jointly with the Asian Development Bank with assistance of the Islamic Development Bank.

Using the CASA-1000 project as an example, one can make certain once again that, despite investment support from world financial structures, inconsistency and a mutual distrust between certain Central Asian countries may substantially slow down implementation of this vital international project.

The CASA-1000 project involves four countries – Kyrgyzstan, Tajikistan, Afghanistan and Pakistan. The first two are suppliers of electric energy, and two others, its consumers. The project envisages sale of electric energy in summer period when Kyrgyzstan and Tajikistan discharge large volume of water for irrigational needs of neighbouring Kazakhstan and Uzbekistan. The project is designed to transfer 1300 MW of electric energy per year.

The main obstacle in the way of implementation of this project (in addition to the situation in Afghanistan where military operations still continue) there is a shortage of generating capacities in Kyrgyzstan. Growth of consumption of electric energy in the republic resulted in its shortage in the domestic market. And it is not only an infrastructural problem. In recent years a reduction of the amount of precipitation has been registered even more often in Kyrgyzstan, resulting in a decrease of amount of water in water reservoirs. In the winter of 2015, for the first time for many years, Kyrgyzstan imported electric energy from Kazakhstan.

But the success of the CASA-1000 project will depend in many respects not only upon capability of Kyrgyzstan and Tajikistan to produce electric



Source: [230]

Fig. 44. CASA-1000 project map

energy in required amounts, but also upon how successfully and efficiently both countries will be able to manage water resources. Especially as this question is associated with political factors. In particular with the position of Uzbekistan which opposes construction of new hydroelectric power stations both in Kyrgyzstan, and in Tajikistan. The Uzbek management believes that such objects will lead to the reduction of rivers' runoff used by Uzbekistan for irrigation.

At the same time, according to provisional estimates of the World Bank and the Islamic Development Bank, the infrastructure necessary for energy generation under CASA-1000 project is already available even without input of new generating capacities. However, to supply it to the Southern Asia, it is necessary to build two power transmission lines with total length of more than 1200 km, as well as three substations – in Sangtuda, Kabul and Peshawar.

It should be emphasised that work under the project proceeds. Its implementation will promote integration and expansion of markets in the interests of development of trade, as well as will help to find sustainable solutions in the field of water resource management.

Generalizing, it should be noted that the development of natural and energy potential of the Central Asia countries is advantageous not only for them, but also to the most advanced developing countries adjoining to this region. When it comes specifically to the Eurasian Economic Union, it is objectively interested in the creation of a system of trade and industrial clusters for the purpose of mutual exchange of goods and services. Such integration can give impetus to the development and industrialization of the countries of the region, being accompanied by a measurable synergy effect.

Implementation of internal, and external energy policy of Russia implies construction of a new and development of the existing infrastructure, including interstate infrastructural projects. Creation of common economic and energy spaces is among key strategic tasks of Russia. First of all it applies to former Soviet republics. And the states of Central Asia take not the last place here.

Participation of Russia in implementation of international infrastructure projects, in particular in Eurasia, is preconditioned not only by its unique geostrategic and geopolitical position in this part of the world. Without participation of Russia none of Eurasian (including Central Asian) projects can be implemented with sufficient cost efficiency. However Russia does

not strive for domination in these projects. On the contrary, it sees therein a source of further deepening and development of cooperation on the Eurasian space, a source of building real partnership as opposed to rivalry (that does not however exclude market competition). Ultimately, creation of the international energy infrastructure is the most reliable way to building the Eurasian energy civilization for the benefit of all people living there.

9. EUROPEAN UNION: QUO VADIS?

Consolidation of Europe is one of the most significant geopolitical events of the 20th century. The European Union (EU) is not any more just a geographical space where sovereign states are situated (Fig. 45). As a result of a large-scale and deep integration the EU became a powerful geopolitical center. His main geostrategic partner are the USA. Despite their own geopolitical and geoeconomic interests North America and Europe form a uniform civilization space – the West. In all spheres of life they have more features in common, than dissimilarities. The geopolitical weight of the European Union is determined by mere fact that a third of the population of the Earth lives in the European zone of influence, including trade, credits, foreign investments, economic help, etc.

By the end of the 20th century the European Union reached outstanding results, having become an example of post-historical, nonviolent, humane international order. However, since the middle of the 2000s, the EU entered a period of a multi-level crisis caused by various reasons:

- falling of competitiveness of economies of most EU countries in the world markets;
- excessive for the modern world «sociality» of most of countries, undermining their economic competitiveness;
- too fast and disproportionate expansion of the union in the 1990s (not justified economically, but determined, mainly, by political reasons) which aggravated cultural and economic differences in the EU;
- introduction of euro (also primarily for political reasons) without joint economic management obligatory for a common currency;
- decision to move towards a uniform foreign and defence policy, resulted in a «least denominator policy», which brought to further weakening of the European countries in the outside world.

Other reasons include virtually failed multiculturalism model (since nobody has been purposefully preparing for it!); departure of the European elite from many traditional values; deepening of political and cultural gap between the masses and the elite; delegation of powers from national governments to Brussels («democracy shortage»). At the same time the reached democracy level in most European Union countries makes the elites incapable to take long-term and difficult decisions. Their leadership becomes

weaker. Besides the world round Europe opted for a «non-Eurasian way» – re-nationalization, military-political destabilization, return of power policy. And Europe has no tools to influence such world [149].

Some experts even speak about degradation of the Europroject. Whether it is true or not – it remains to be seen. Meanwhile we witness a re-nationalization trend in the EU, right-wing nationalists become more active, fuelled by migratory processes which struck Europe. It cannot be ruled out that in some ways such situation somewhat expands opportunities



Source: Wikipedia

Fig. 45. European Union countries

of Russia. But more likely, it creates for Russia more new problems. Instead of a comfortable, stable and rich neighbour Russia may get many challenges, and even conflict situations. Turbulence within the European Union will make it more awkward and less reliable partner. At the same time Russia cannot rely upon EU bodies in Brussels to which many national functions were delegated: they are losing efficiency [149].

Anyway, Russia is and will be connected to the Euro-Atlantic region countries – in addition to geographical, economical and historical ties – by deep all-civilization roots. It is not by chance that the Concept of Foreign Policy of Russia establishes priority of development of relations with European countries. The progress towards creation of a uniform economic and humanitarian space from Atlantic to the Pacific Ocean is postulated as the main objective. Russia is intrinsically interested in deepening of cooperation with the European Union which remains to be its main trade and economic and an important foreign policy partner.

Historically, the share of European Union countries in the Russian trade balance exceeds 50% of its global trade, while Russia's share in the European Union trade balance does not exceed 10-12% of its world trade. Supply of Russian hydrocarbons to the European Union reaches 85-90% of EU import; 30-35% of total EU import of fuel and chemicals. EU account for 65% of machines and equipment imported to Russia, however does not exceed 6-7% of total export of machines and equipment from the European Union to the world markets. The European Union depends on Russia in such sensitive sphere as energy safety. And Russia depends on the EU in a broad range of deliveries, including critical equipment.

Sale of hydrocarbons to the EU brings more than \$160 billion to the Russian budget, 13% of GDP. Russian share in total gas import by EU countries varies from 30% to 40% (about 160 billion cu.m.⁷⁰). Currently Russia is the only gas exporter to the European Union which has spare pipeline capacities. However we should not lose sight of the fact that Europe may in fact replace gas supplied from Russia by Algerian and other gas from North Africa (40-50 billion cu.m.), Norwegian gas (20 billion cu.m.) and LNG (theoretically about 130 billion cu.m.). Besides, there is a possibility of construction of pipelines from Iran, Turkmenistan and Gulf States [231].

⁷⁰ In 2016 Russia delivered record 179.3 billion cu.m. of gas [232] to foreign countries (Europe and Turkey).

The European Union significantly depends on oil import: in 2013 import covered 83% of needs of the countries of the union for this energy carrier. The shares of prime oil suppliers were as follows:

- Russia – 29%
- Norway – 12%
- Nigeria – 9%
- Saudi Arabia – 8.9%.

However, Russia depends on the European Union to no lesser extent. The EU buys 75% of the Russian oil export, 70% of which are supplied via pipelines [231].

A deep structural dependence of the Russian financial and investment market upon European infrastructure and legislative system is confirmed by the fact that more than 80% of total amount of direct foreign investments to Russia have a European origin.

At the same time, according to the Ministry of Economic Development of the Russian Federation, goods turnover of Russia with the European Union countries fell in 2015 by 40% as compared to 2014, to \$230 billion. The EU share in total goods turnover of Russia in 2015 was 44.5%. Export reduced by 37.7%, and import, by 41.5%. Key partners of Russia in 2015 were Germany (\$44 billion), the Netherlands (\$43.5 billion), Italy (\$30.1 billion). For reference: goods turnover with the USA in 2014 amounted to \$29.1 billion [233].

Such decrease in volumes of mutual trade (hopefully temporary!), caused by crisis phenomena in the economy of both Russia, and the EU countries, as well as mutual trade sanctions and restrictions, cannot cancel basic philosophy of the Russian government aimed at development of cooperation with the EU, as well as willingness and readiness for recovery of lost positions in the Russian economy declared in the EU at various levels (from heads of certain EU member states to largest businessmen).

Russia is also committed to the development of mutually beneficial energy cooperation with the European Union for the purpose of creation – in the long term – of an integrated energy complex of Europe on the basis of strict observance of bilateral and multilateral contractual obligations.

In the field of energy, Russia and the EU are old and interdependent partners. As we mentioned above, the European Union is concerned with ensuring its energy security. However, the issue is complicated as it takes on a political connotation. The transition from «transparent» and clear

free market to the use by producing countries of their oil and gas resources to pursue their geopolitical goals is obvious. Russia also does not hide that consolidation and centralization of its oil and gas assets is a political lever. Europeans are afraid to get into dependence on Russia. This explains aspiration of the European Union to diversify the sources and ways of delivery of energy resources.

And though theoretically Europe may replace, for example, import of the Russian gas by raw materials from other sources (see above), in practice this also bears certain risks. Here is an example with Qatar: it supplied to Europe considerable amounts of liquefied natural gas, but as soon as gas price in Japan rose, Qatar suppliers at once reoriented towards Japanese market, and reduced European deliveries by 25 billion cu.m. per year. And the formed gap was closed by Russia, which confirmed its role of a stabilizing factor for Europe.

Top-of-the-agenda objects of European consumers include approaching the Middle East. Iran and Iraq may become key suppliers of hydrocarbons to Europe over time. However, it would become possible only on condition of stabilization of the political situation and establishment of peace in this region [234].

The «Program of the European Union Strategy in the Field of Energy and Fight Against Climate Change for the Period Till 2030» (approved in 2014) establishes three main objectives:

1. Greenhouse gas emissions reduction by 40% as compared to the 1990 level.
2. Increasing RES share in the energy consumption structure at least by 27% as compared to the 1990 level.
3. Further increase of energy efficiency. Development and implementation of new indicators and making necessary amendments to the management system to ensure competitiveness and safety of the European Union energy system.⁷¹

In its strategic forecasts the European Union proceeds from the assumption that its dependence on import of energy resources will remain. In the medium-term and long term gas import will increase whereas oil import will remain at the same level or will grow slightly. Thus, the achievement of declared indicators of energy strategy of the EU will hardly affect hydrocarbon import volumes of union member countries.

⁷¹ By 2050 the EU intends to reduce greenhouse gas emissions by 80-95% as compared to 1990.

At the same time, gas supply diversification, in particular on account of import from the Middle East, and African countries and the USA (LNG), will be restricted by limited capacities of the respective infrastructure.

As for the role and place of the nuclear power industry in the energy supply of the European Union countries, according to experts, new NPPs shall be built due to the expiration of the service life of old stations. Many EU countries, including Poland, the Czech Republic, Great Britain, France, Italy, Finland, Bulgaria, Hungary and Romania – revealed their plans of construction of new nuclear power plants. Generally speaking, meeting the requirement of public of some countries (for example, Germany) to refuse the use of nuclear power would mean for Europe still bigger dependence on import deliveries of other energy carriers, including gas from Russia. This circumstance should be also taken into account at assessment and forecasting of relations of Russia and the European Union.

Due to geopolitical shocks which began in 2014 the idea of creation of a uniform energy market of the European Union received a new powerful impulse. It was embodied in the concept of the EU Energy Union. Officially this concept was presented to the heads of states and government of the European Union by the president of the European Commission J.-C. Juncker, and approved by them in March, 2015. The concept sets a task of provision of «consumers of the European Union – households and businesses – with reliable, sustained, competitive, affordable energy. Achievement of this purpose will require a fundamental transformation of the European energy system» [235].

Main characteristics of the Energy Union:

- interdependence of the European Union countries in reliable energy supply of their citizens on the basis of solidarity and trust. In global relations the Energy Union speaks as «one voice»;
- integrated energy system with free cross-border energy transmission;
- sustainable, low-carbon and environmentally friendly economy;
- availability of strong and competitive European companies developing industrial goods and low-carbon technologies intended to increase energy efficiency;
- availability of qualified labour force able to create and manage future energy systems;
- confidence of investors based on pricing signals reflecting long-term policy needs and goals;

- increased role of citizens of the European Union in functioning of the market, their active participation in the process of transition to a new energy industry and consumers benefiting from implementation of new technologies.

Characteristically, the Energy Union concept does not mention Russia among EU partners. It states only that «The European Union will study the matter of reviewing relations with Russia in the field of energy, being based on an equal footing from the point of view of market openness, fair competition, environment protection and technical safety» [235].

At the same time, as it is specified in the concept, the European Union will aim in every possible way for the establishment of strategic energy partnership with all important energy producing countries and regions, in particular with Algeria, Turkey, Azerbaijan, Turkmenistan, the Middle East, Africa, etc., as well as energy transit countries. Certainly, Norway, Canada, and the USA are traditionally among energy suppliers.

Taking into account actual political situation, the European Union shall give special attention to the development and deepening of strategic energy partnership with Ukraine in order to decrease in its dependence upon energy import. Gas transit and reforming of the Ukrainian domestic energy market are mentioned as first-priority issues.

In addition to the already mentioned provision on strategic partners of the European Union, the draft concept of the Energy Union contains two more new issues causing so far disagreements among the EU members. These are the *single gas import channel* and *transparency*. The first mean centralization of the procedure for the conclusion of intergovernmental gas import agreements. The European commission prepares also suggestions on introduction (in certain cases) of the principle of transparency in commercial contracts for gas supply from third countries. In other words, the regulation of gas supply to EU countries is brought beyond the limits of national jurisdiction.

In our opinion, the Russian side shall give serious consideration to the plans of creation of the EU Energy Union and, whenever possible, to join this process (at least, at an expert and information level within the framework of the resumed Energy dialogue Russia – EU). It would allow to avoid surprises and difficult-to-repair effects of decisions adverse for Russia.

In this regard it is possible to agree with the assessment of the former European Commissioner for Enterprise and Industry Günter Verheugen

stated by him in the interview to Deutsche Welle media company: «Russia is an important and strong partner. Russia is an integral part of Europe. Consider, for example the issue of future energy supply of Europe. We need Russia as an economic partner, as a partner in overcoming global challenges. Yes, we need Russia. But Russia also needs us». At the same time the ex-European Commissioner expressed an opinion that «Russia needs modernization, but it is impossible without cooperation with the EU» [236].

So, summing up, it should be noted that in foreseeable future trade relations between the European Union and Russia will remain, most likely, rather stable. Though it is impossible to exclude that they may be slowly downscaled. The EU will depend less on Russia in the field of energy security, and Russia will obtain bigger independence of Europe both in financial, and in industrial and infrastructural spheres.

The title of this section on the European Union contains a sacramental question «Quo vadis?». In fact, the EU has a difficult and winding way ahead of it to achieve goals declared in the European Union Agreement of February 7, 1992 (so-called Maastricht Agreement). This way, figuratively speaking, will be some kind of movement on shaky spiral stairs. It will be accompanied by kickbacks (the eurosceptics movement in some leading European countries, the results of referendum in Great Britain about exit from the union, etc.), but each step backwards will comprise an accumulated experience of movement towards unity and will serve as a stair-step for the next stride forward, etc.

However, if we consider the European Union as one of stages of the objective globalization process, we have to admit that the idea of consolidation of Europe has no alternative. One may argue only on ways of its implementation, speed and content of integration processes.

So-called «regionalization» – which is sometimes positioned as a counterbalance of globalization – as a matter of fact is one of stages on the way to a more profound, «optimized» globalization. Partly regionalization is a response to the aspiration towards an accelerated globalization (which is quite often artificially forced to please to political considerations of the moment) without taking into account actual readiness (economic, political, mental, etc.) to such a «merger».

In this situation a step backwards on the spiral may be even beneficial for the solution of global tasks: in any case unsolved specific problems will have an effect sooner or later, disturbing general progress. However at that time

their overdue solution may be associated with much bigger geopolitical and material costs.

The refugee crisis that assailed Europe in 2015 and is still very far from settlement shall be viewed just in this way. It was caused not only by material and social reasons (though by them also in no small measure), but first of all by unpreparedness of state institutions and population of European countries to «mental integration» of migrants into civilization environment, which is alien for them. However, this «environment» has not developed yet an understanding that the integration is a movement towards each other. And this process is long, not trouble-free and, unfortunately, not frictionless. It will demand from Europeans not only patience, but also amending economic, social and cultural policy of the European Union countries that will be inevitably followed by a loss or reduction of the amount of some usual social benefits, comfort, etc., etc. It is naive to expect that local population will treat it with delight or even simply with readiness to certain sacrifices.

However migrants shall also understand that integration is a movement towards each other, that nobody will allow them to establish their rules in others countries. This could be possible only if the purpose of migration is to conquer other countries. But conquerors around the world are treated not as refugees asking for shelters.

Such understanding may become a guarantee of successful integration of «new Europeans» into the existing order. The mission of politicians is to promote as much as possible such understanding, to use migration potential, first of all, for the benefit of preservation of the European unity and identity.

Epilogue

Considering the issue of the Eurasian energy civilization from the point of view of «future energy», we emphasized that the bases for «future energy» are laid by the humankind already today. Factual evidence of current and forecasted development of leading entities of the world energy – specific countries and their associations – provided in this publication make it possible to reveal, in our opinion, those vectors of development of the energy civilization which, as it seems as of today, will shape it in the next decades. At the same time, it means also construction of the foundation for sustainable development of the world civilization in the 21st century.

Distinctive features of the new civilization include its life-sustaining system using both production of goods in the interests of socio-humanistic society, and organization of this process with the use and expanded reproduction of a new energy potential. This potential includes not only natural, but also new man-made technological, intellectual and cultural resources. This process of expanded production of new civilization benefits which at the same time represent also the potential of sustainable development of the «nature-society-person» triad is the essence of social and natural evolution of the world. The human plays a key role therein – not as a producer and consumer of these benefits, but as an organizer of this general process of life based on objective laws of development of the biosphere.

Some say that the Eurasian civilization is a separate world. With certain reservations it is possible to speak, for example, about Russian or Chinese civilization, as well as about a great number of others, distinguishing them as independent phenomena. And such specific and applied analysis of separate civilization types has fairly scientific bases. If not to forget that planet Earth is an integral whole. And all peoples and civilizations arise and develop on Earth in interrelation with each other. In general, figuratively speaking all world history is an «engagement» of nations and peoples with each other. And in the 21st century this «engagement» will become more and more intensive and interpenetrating. So in the long run, perhaps, beyond the 21st century, geographical and national features of various civilization communities will become less determining. There will be some kind of «amalgam», an alloy of cultures with preserved individual, including anthropological (genetic) codes. Not only cultural and religious distinctions, but also belonging to various «tempo-worlds» will ever smaller impact on development of the civilization.

But this is only in theory. Actual processes which develop before our eyes between communities on the Eurasian continent, are in continuous interaction, going beyond its geographical framework. Similar to the movement of terrestrial layers which leads to natural cataclysms, there is a peculiar overlapping of various civilization «continents» featuring their own specific communities. Geopolitical importance of the states also undergoes changes during new global redistribution. Moreover, the Slavo-Turkic alliance which historically passes through the Genghis Khan's empire, the Golden Horde and the Moscow kingdom, to Russia's Romanovs dynasties and the Soviet Union is being filled with a new contents. At the beginning of the 21st century eurasianism turns into a strategy filled with specific sense, into a geopolitical platform, as well as into an idea with a high practical value.

Energy security becomes an element of future strategic vision, varying depending on specific subjects of the international policy, but outlining trends of global and regional opposition. Energy dependence of Europe on Russian and Asian sources of strategic raw materials characterizes a complex symbiosis of the European-Eurasian relations. Functioning of the East-West system becomes more and more complicated in view of economic and political unpredictability on the European space, as well as political cataclysms in the Islamic world which are to a greater or lesser extent associated with Russia and energy Eurasia.

The future image of the world civilization is being shaped by the existing generation. Provided that people will have enough reason to overcome contradictions that often seem insuperable and to eliminate sources of misunderstanding and hostility (religious, cultural, historical, territorial, etc.). Otherwise all reflections about future of the humankind may turn out to be useless because there will be nobody to implement them, and nobody to use civilization benefits.

Therefore, while building future civilization materially based on «future energy», the humankind will inevitably have to cope first of all not with technological, but with intellectual and cultural challenges. In this context, it is crucial that elite, top officials of the states were initially involved in this process.

Authors do not claim that they have comprehensive answers to the questions raised in this publication. This publication is a kind of *search*. And authors will consider the task fulfilled if they manage to involve their colleagues and interested readers in the continuation of this search.

Since we are talking about search, subsequent work will be efficient only if it is conducted within various areas: energy, philosophy, history, ethnography, linguistics, cultural science and other scientific areas, including those adjacent to the above-mentioned. That is a deep study of intercivilization processes in which the energy objectively plays a consolidating role, has to proceed in a multidisciplinary space where each discipline problematize its own area. In this respect the subject of «a new energy civilization» will be able to play the role of an «umbrella term» consolidating various scientific disciplines and their research practices. The results of these multidisciplinary researches can be brought to a common denominator (if it is at all possible!) only by a large group of scientists united not so much organizationally, but, first of all, by a common goal: to give – on the basis of fundamental and applied researches – answers to topical issues of formation of a partnership of civilizations and ways of their further development and mutual integration.

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