

The EU Energy Policy – Current State and Perspectives for Development

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Summary: The paper is focused on the question how to secure competitive and clear energy for Europe in the conditions of climate change, constantly growing global energy demand and obscurity regarding future supply. The paper points out the contemporary problems with regard to the constant growth of the energy price and the striving for keeping the planet environmentally clear as well as some suggestions for their decision like the usage of renewable sources of energy.

The instruments for the implementation of the future EU policy in the field of energy have been described. These instruments include the development of technologies ensuring energy from renewable energy sources, programs for energy efficiency, guarantees for the energy supply by diversification of the energy mix, mutually advantageously collaboration with the energy suppliers, securing of good financing for the separate programs and projects, provision of information for the society and transparency of the policy and all actions in the field of energy.

Key words: renewable sources of energy, the EU energy policy.

JEL: F15, Q43.

The world today is facing energy and environmental challenges – the exhaustion of traditional energy sources (coal, oil, natural gas, uranium ore) and the significant industrial growth lead to increase in the traditional energy production causing both serious environmental damages and threatening people’s health. This challenge is acute for Europe, and shared by all Member States. How to secure competitive and clean energy for Europe and avoid the climate change in the conditions of global energy demand and future supply uncertainties? In an era of high technologies and technical revolution one of the most important tasks is the invention and implementation of renewable energy sources and boosting investment in energy efficiency projects.

The days of cheap energy for Europe are over. The challenges of climate change, increasing import dependence and higher energy prices are faced by all EU member states. Moreover the interdependence of the EU Member States in the energy field, as in many other areas, is increasing – a power failure in one country will have immediate effects in the others. “Europe needs to act now, united, to deliver sustainable, secure and competitive energy.” In doing so the EU has to return to its roots. In 1952 with the Coal and Steel Treaty and in 1957 with the Euratom Treaty, the founding Member States have seen the need for a common approach to energy.

Energy markets and geopolitical considerations have changed significantly since then, but the need for European action in this sphere is stronger than ever. Without it the EU's objectives in other areas, including the Lisbon Strategy and jobs and the Millennium Development Goals, will be more difficult to achieve. A new European Energy Policy needs to be ambitious, competitive and long-term – and to the benefit of all Europeans.

Energy policy must be addressed by many different policy areas. For example, the social dimension of Europe's energy policy needs to be taken into account throughout all stages of designing and implementing the individual measures.

The starting point of the debate for the EU energy policy is determined by three main factors:

1. Geopolitical. Europe is becoming increasingly dependent on hydrocarbons import. With the traditional industries the EU's energy import dependence will jump from 50 % of total EU energy consumption today to 65 % in 2030. Reliance on gas imports is expected to increase from 57 % to 84 % by 2030, of oil from 82 % to 93 %. This carries political and economic risks. Major priority to be pursued by an effective external EU Energy Policy during the next three years is to enhance relations with external energy suppliers, further developing comprehensive partnerships based on mutual interest, transparency, predictability and reciprocity.

2. Combating climate change. The EU strengthens its efforts to promote the fight against climate change, to coordinate energy policies and to strengthen the cooperation on clean technologies. The EU's intention is to invest in research and innovative programmes for energy production and environmentally friendly transportation. Burning of fossil fuels (oil, gas, coal and others) could cause a variety of ecological disasters; there are great risks with their transportation as well – for example accidents with petrol tankers polluting large regions.

3. Geological. The competition for energy resources is intense on a global scale and a number of scientific analysis state that in 50 years there will be no oil and natural gas resources left, moreover their supply will become more and more expensive and irrational.

The EU is becoming increasingly exposed to price volatility and price rises at the international energy markets and the consequences of the progressive concentration of hydrocarbons reserves in few hands. In order to limit its growing exposure to oil and gas prices volatility and to bring about a more competitive EU energy market, the new Energy policy should switch to "**low- carbon economy**", using less fossil fuels (in the industry and transport sectors as well as in individual households) and stimulating innovation technologies in the renewable energy sources (for electricity generation, heating and cooling of buildings and in transportation). That could be achieved by the usage of wind energy (especially at the seaside regions), bio – fuels available for the mass consumer and building hydro and solar power plants.

Next step will be adapting to "hydrogen" economy and the European Technology Platform for Hydrogen and Fuel Cells has paved the way to this change.

Existing measures in areas such as production of electricity from renewable energy sources, biofuels, energy efficiency and the Internal Energy Market have achieved important results but lack the coherence necessary to bring sustainability, security of supply and competitiveness. No one element of the policy provides a final decision to the EU's problems in the energy field – they must be taken together as a whole.

According to the new Nuclear Programme, the EU should develop further advanced framework for nuclear energy for those Member States that choose nuclear power, meeting the highest standards of safety and non-proliferation as

required by the Euratom Treaty. Many active power plants have already reached their effective potential and new investment projects should be developed to balance the “supply – demand” equilibrium.

Nuclear power also raises important issues regarding waste radioactive materials and decommissioning, so nuclear waste management should be also included in future Community work. Efforts to meet the Kyoto Protocol targets should continue, while current tendencies show they are hard to reach.

Energy production accounts for 80 % of all greenhouse gas (GHG) emission in the EU which is the basic factor for climate change and most air pollution. The EU is committed to reduce the EU and worldwide greenhouse gas emissions at a global level to a level that would limit the global temperature increase to 2°C compared to pre-industrial levels. Current energy and transport policies would secure an increase in the EU CO₂ emissions with 5 % by 2030 and global emissions rise by 55 %. The present energy policies within the EU are not sustainable. Although there are possible CO₂ emission quantities defined, companies exceeding these limits are allowed to buy carbon allowances from other smaller producers. This stimulates the more effective energy use and helps to decrease the air pollution with CO₂. With the help of the latter mechanism the EU abides its Kyoto protocol obligations for combating climate change.

1. Traditional Energy Sources in the European Union energy mix

An effectively functioning and competitive Internal Energy Market should provide security of supply and high standards of public service. The effective separation of the transport networks from the electricity and gas production businesses results in real incentives for companies to invest in new infrastructure, inter-connection capacity and new energy generating capacity, thereby avoiding unnecessary price surges. A true single market promotes diversity.

Oil and gas resources are not evenly distributed. The demand for them though is constantly growing not only in the developed countries, but in the intensively developing ones like China and India as well. The most significant oil and gas fields are located in politically or economically unstable regions like the Near East and Russia. Arguments between neighboring countries in these regions (for example between Russia and Ukraine in January 2006 or Russia and Byelorussia in January 2007) could lead to significant decrease in the pipelines supply for the Member States. The geopolitical aspects of the Energy policy for Europe are an integral part of the Foreign Policy of every Member State.

Approximately 50 % of the energy sources used in the European economy are fossil fuels – oil, nature gas or coal. The breakdown of energy

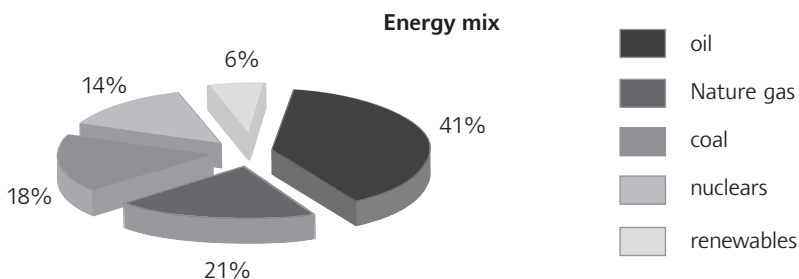


Figure 1. Energy consumption in the EU by type of energy source

Source: European Energy Outlook, <http://www.euractiv.com/en/energy>

consumption by types of energy sources is presented on Figure 1.

Energy production based on European "domestic resources" provides the following shares: 29 % of the nuclear energy; 22 % of fossil fuels; 21 % of the nature gas; 16 % of the oil and 12 % of the renewable energy sources.

Even with the targets on energy efficiency and renewables, oil and gas will continue to cover half of the EU's energy needs, with import dependence high in both sectors (over 80 % for oil and some 45 %, expected to reach another peak of up to 93 % in 2030). 2/3 of the imported raw petrol in the EU is from the OPEC countries. Russia is dominating the nature gas import market. Coal is more widely distributed in many European countries, but its high generation expenditures make it impossible for this source to compete with the cheap imported gas. Nuclear energy generation and renewable sources energy production is sufficient for the European market needs.

High energy prices are particularly damaging for developing countries. Whilst a few developing countries might benefit as producers, the others meet the increased costs of energy imports outstripping their development aid receipts. Africa and other developing regions have a vital interest to boost diversification and energy efficiency – this can make a major contribution to the Millennium Development Goals. The EU is committed to support developing countries in promoting sustainable and secure energy supply and use. Oil import and prices are heavily dependent on the geopolitical situation in the Gulf region that may bring insecurity in the European Energy System. It is also threatened by the unstable political situation in Iran – the major disrupter of the supplies from both the Gulf and the Caspian basin. Iran is holding control of the Hormus straight – the transit point of over 40 % of the daily world traded petrol. The blocking the straight would be the worst scenario in an eventual political or military conflict in the region.

Presently the EU is addressing Iran's instability as political problem only, but it should also consider the potential economical consequences.

The International Energy Agency (IEA) expects global demand for oil to grow by 41 % by 2030. It is not clear however how supply will keep up with this demand: the IEA in its 2006 World Energy Outlook has stated that "the ability and willingness of major oil and gas producers to step up investment in order to meet rising global demand are particularly uncertain". The risk of supply failure is growing.

Moreover the mechanisms to ensure solidarity between the Member States in case of an energy crisis are not yet in place and most of the Member States are largely or completely dependent on one single gas supplier.

The EU has strategic reserves of different types of fuels in order to decrease its vulnerability to possible crisis in the world energy markets. Long – term security of energy supply requires cooperation with a bigger number of smaller energy suppliers.

A deepening dialogue and relations with the key energy producers and transit countries is necessary, through the OPEC and the Gulf Cooperation Council, by implementing the Memoranda of Understanding with Azerbaijan and Kazakhstan and by establishing new ties with other Central Asian producers like Turkmenistan and Uzbekistan.

It is important to facilitate the transport of the Caspian energy resources to the EU. The European Commission has presented a Communication on the Cooperation with the Black Sea Council in Spring 2007 in this respect.

Enhancing the relations with Russia through the negotiation of a new, comprehensive framework agreement, including a fully-fledged energy partnership benefiting both sides and creating the conditions

for new investments is necessary. This agreement should emphasize the mutual long-term benefits to both Russia and the EU and be based on market principles and those of the Energy Charter Treaty.

For the past few years geopolitical considerations dominate over economic measures in the energy policy field. As the margins for maneuvers for the EU energy supply are weak, the strategy should try to maximize the geographical diversification of the energy supplies to areas like Latin America and the Caribbean.

The European Commission gave its conditional approval to invest in 3 major oil pipelines and 2 gas – pipelines located in South East Europe:

- The first Oil pipeline project is designed to connect the Bulgarian port of Burgas with Alexandroupolis in Greece. The pipeline will transport oil from the Russian terminal of Novorossiysk, bypassing the congested Bosphorus straits. It will have an initial annual capacity of 35 million tones that could be expanded to 50 million tones. The Russian companies Rosneft, Transneft and Gaspromneft will acquire 51 %, the Greek corporations will get 24.5 %, and the Bulgarian ones will hold the other 24.5 % of its value.

The oil pipeline will be 280 km long and 135 kilometers of the pipeline will be on Greek territory. The project will have a total budget of 750-800 mill. Euros (in 2007 prices) and a transport capacity of 35 mill. tones per year.

The storage facilities that will be built at the port of Alexandroupoulos will have a total capacity of 650,000 tones; they will have special loading and unloading infrastructure and will be able to serve tankers of up to 300,000 tones. The construction of the pipeline is expected to be completed by the beginning of 2009.

The Burgas – Alexandroupolis oil pipeline project is important not only for Bulgaria, Greece and

Russia but for the entire EU. The oil pipeline will shorten the transportation route of Russian oil from the Caspian region to European energy market. Burgas-Alexandroupolis will transport Russian oil through the Bulgarian port of Bourgas to the Greek port of Alexandroupolis bypassing Bosphorus Strait in Turkey. The Bosphorus Strait is too busy due to its specific geographical location and capacity. **The pipeline project will guarantee the direct access to various oil resources as well as oil transportation from Russian Novorossiysk.**

Bulgaria's location and political and economic stability will guarantee the safety of natural gas and oil transportation through its territory. Major foreign investors, among which some energy giants, have showed interest to participate in the project.

- A US-registered company, **the Albanian-Macedonian-Bulgarian Oil Corporation (AMBO)** plans to build a second regional oil pipeline that will compete directly with Burgas-Alexandroupolis. The project received the backing of the US government and was first conceived by the Halliburton Energy Corporation which conducted the feasibility study.

The AMBO pipeline will be 912 km long, transporting 35 million tones of oil annually. It will connect the Black Sea with the Adriatic sea and, to a wider extent, Central Asia with the Italian peninsula. The project is expected to be completed by 2012. It will, according to its advocates, help the balance of the oil prices in the world market.

Top representatives of Macedonia, Bulgaria and Albania have met in Sofia to ink a memorandum of understanding with Ted Ferguson, the president of the AMBO (Albania-Macedonia-Bulgaria Oil) pipeline project. The American-based corporation has been struggling since 1994 to get the attention of key political and industrial backers, in order to begin the construction. The first obstacle was the preoccupation of relevant parties in the Clinton Administration with the Baku-Tbilisi-Ceyhan pipeline in Anatolia.

Later came the wars in Kosovo and Macedonia in 1999 and 2001 that left investors jittery. Now the situation seems stable and the future looks bright for AMBO. The construction of the oil pipeline is of strategic interest for Macedonia as well.

But is the signing merely symbolic? The rival pipeline Burgas – Alexandropolis that looked good enough to start until recently appears to have stalled due to internal disagreements between Russia, Bulgaria and Greece. The AMBO president Ted Ferguson claims that his project has received \$900 million of investor funds from the Overseas Private Investment Corporation (OPIC) – a US development agency, the Eximbank, Credit Suisse First Boston, and others. “A big mystery until now had been whether the AMBO project actually had any solid backers. While the cash now appears to be there, an announcement has yet to be made regarding backing parties of the oil industry.

As could be expected, the Greek government supports the Burgas-Alexandropolis alternative

for its relative cost-effectiveness and time-saving qualities. However, as supporters of AMBO have long pointed out, the Burgas-Alexandropolis project does not really take care of environmental concerns, because avoiding the congested Bosphorus strait it merely transfers the problem to the island-congested Aegean sea. An oil spill in the Aegean would be devastating for Greece’s tourism industry. **The AMBO project avoids the sea entirely**, crossing the Balkan Peninsula overland and terminating at the Adriatic port of Vlore.

- The European Commission has also expressed interest in a **third regional oil pipeline project**, connecting the Romanian Black Sea port of **Constanta** to **Trieste**, an Italian port on the Adriatic Sea. The pipeline will pass through Serbia, and probably the negotiations on the Kosovo’s status will affect the project.

Five Southeast European countries – Croatia, Italy, Romania, Serbia and Slovenia have interest in the 1,856 km long pipeline that will carry 40 million

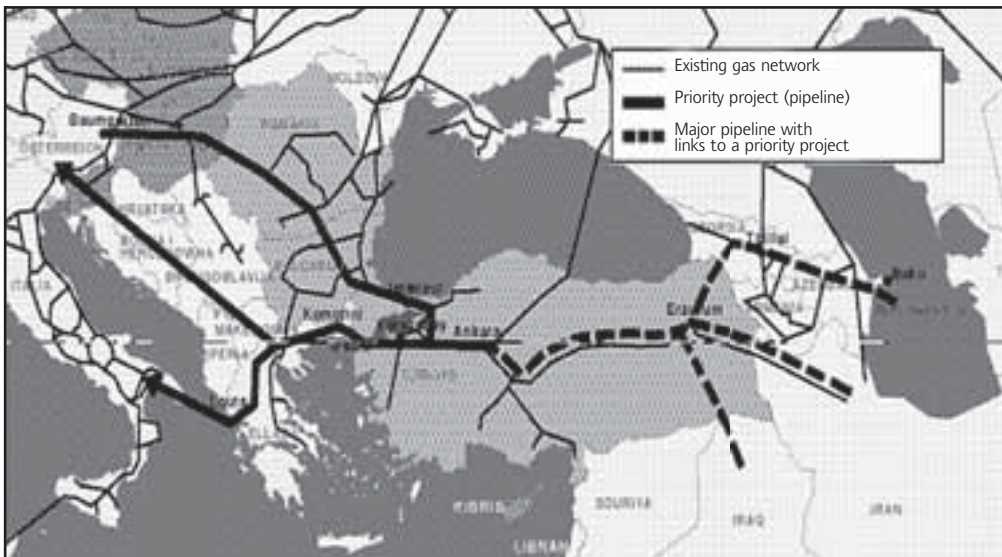


Figure 2. Nabucco pipeline project route
Source: the European Commission

tones of oil annually in its first phase and has the capacity to transport 90 million tones at a later stage. The EU Energy Commissioner Andris Piebalgs has signed the project. This provoked discontent in the Kremlin, since Russia has been excluded from the project, even though the EU currently gets half of its crude oil and natural gas from Russia.

- **The Nabucco project** is a new gas pipeline connecting the Caspian region, Middle East and Egypt via Turkey, Bulgaria, Romania, Hungary with Austria and further on with the Central and Western European gas markets

The pipeline's length is approximately 3,300 km (2,050 miles). It will start from Erzurum in Turkey to Baumgarten an der March, a major natural gas hub in Austria. Most of the gas volumes, reaching Baumgarten will be further transported from Austria to the Central and Western European Countries. Some analysts consider the pipeline as a diversification from the current practice of importing gas solely from Russia.

Nabucco could bring gas supplies from Iran, Azerbaijan, Kazakhstan, Turkmenistan, Egypt and Syria. Near Erzurum it will be connected with the Tabriz-Erzurum and with the South Caucasus Pipelines that will connecting the Nabucco Pipeline with the planned Trans-Caspian Gas Pipeline.

In the first years after completion the deliveries are expected to be between 4.5 and 13 billion cubic meters (bcm) per year and hardly 2 to 8 bcm of them will reach Baumgarten. Later half of its increased capacity will be delivered to Baumgarten and half of the natural gas transported will be diverted for the markets on the route. In the year 2020 the transmission volume is expected to reach 25.5 – 31 bcm per year, of which 16 bcm will go to Baumgarten. The pipeline has been designed to transport a maximum amount of 31 bcm per year.

The construction of the pipeline is expected to begin in 2009 and to end in 2012. Estimated

investment costs for this completely new pipeline system amount to 5 billion euro. The company leading the project is OMV from Austria. The shareholders of the project company are OMV (Austria), MOL (Hungary), Transgaz (Romania), Bulgargaz (Bulgaria), BOTAŞ (Turkey). All current shareholders have 20 % of the shares. The french company Gaz de France, and German company RWE have also expressed their interest to participate in the project. The consortium could also include the State Oil Company of Azerbaijan and Kazakhstan companies that are interested to join the project. The Nabucco project is included in the EU Trans-European Energy Network program and a feasibility study for the Nabucco pipeline has been performed under an EU project grant.

- The Russian company Gazprom has recently proposed an alternative project competing Nabucco. It offered the construction of a **second section of the Blue Stream gas pipeline** (a major trans-Black Sea gas pipeline that runs beneath the Black Sea from Russia to Turkey), extending it through Bulgaria, Serbia and Croatia to western Hungary.

Blue Stream pipeline was constructed by the Blue Stream Pipeline B.V. – a Netherlands based joint venture of the Russian company Gazprom and the Italian company ENI. The pipeline had been built with the **intent of diversifying Russian gas delivery routes to Turkey and avoiding third countries.**

By 2010, Blue Stream is expected to operate at full capacity, delivering 16 billion cubic meters of gas per year. The length of the pipeline is 1213 km. The Russia's land section is 373-km-long from and includes the Stavropolskaya and Krasnodarskaya compressor stations. The offshore section is 396 km long laying from the Beregovaya compressor station in Arkhipo-Osipovka to the Durusu terminal located 60 kilometers from Samsun (Turkey). Turkey's land section is 444 km long up to Ankara.

The Blue Stream pipeline was the foundation for a “strategic partnership” between Russia and Turkey in oil, energy, and transport sectors. The political decision to sell Russian gas to Turkey was taken in December 1997, when the two countries signed an inter-governmental agreement according to which Russia will supply 364.5 billion cubic meters of gas to Turkey between the years 2000 and 2025.

The existing gas transit route goes through Ukraine, Moldova, Romania, and Bulgaria. This land route makes the gas substantially more expensive, and there are reports of gas being illicitly siphoned off while transported through Ukraine and Moldova. Russia solved these problems by building a pipeline across the Black Sea floor.

In the meanwhile, some Russian economic analysts objected that building a pipeline to Ankara means tying Russia to a monopolist consumer, and Turkey is not a reliable partner. Before the Blue Stream’s opening ceremony, the USA publicly criticized the pipeline, calling on Europe to avoid becoming any more dependent on Russia for energy.

One of the political goals of the Blue Stream project has been to block the path of rival countries aiming to use the territory of Turkey to bring gas from the Middle East and the Caspian area to Europe. In November 1999, the presidents of Turkmenistan, Turkey, Azerbaijan, and Georgia signed a **four-party inter-governmental agreement** on building a rival **Trans-Caspian gas pipeline**. Within a few months, three major oil companies – General Electric, Bechtel, Royal Dutch Shell – had established a joint venture to work on the competing project.

In the spring the year 2000, however, an argument has aroused among the Trans-Caspian gas pipeline participant nations over allocation of the quotas for Azerbaijan’s use of the pipeline and all construction work was halted. **Thus, Blue Stream won the battle** for the Caspian gas. In the end of 2006 however, the first section of the Trans-Caspian pipeline – connecting the South Caucasus Pipeline from Baku to Erzurum – has been opened.

- **The South Stream pipeline** – on 23rd June 2007 the Italian company “Eni” and the

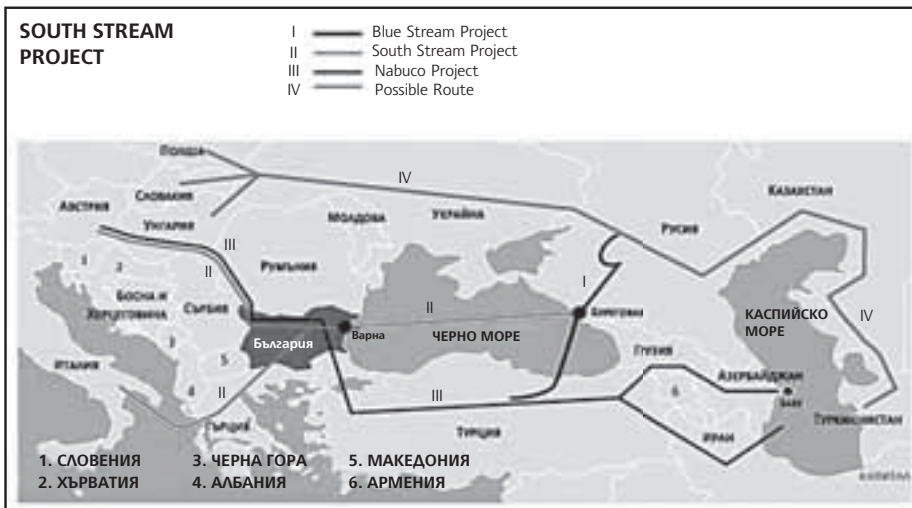


Figure 3. South Stream pipeline project route

Source: Ministry of Economy and Energy, Bulgaria

Russian "Gazprom" signed a **Memorandum of Understanding**¹ for the realization of South Stream, a new gas pipeline system which will link Russia to the European Union across the Black Sea. The South Stream project is the third pillar of the strategic agreement reached between "Eni" and "Gazprom" and signed in November 2006. The Memorandum is for the implementation of a technical and economic feasibility study of the project and for the necessary political and regulatory evaluations for its implementation. The transport capacity of South Stream will be defined by the feasibility studies and on the basis of market analyses that will be carried out in the countries involved in the project and in the end markets in order to optimize the costs. The project is particularly relevant in the context of the significant gas shortage which will be experienced by the EU for the period 2007-2015 as demand increases while internal production decreases significantly.

In its 900-km long **offshore section**, the South Stream will cross the Black Sea from the Russian coast of Berezovaya – the starting point of the Blue Stream pipeline as well – to the Bulgarian coast, reaching a maximum water depth of over 2,000 metres. "Eni" and "Gazprom" will carry out the construction work using the most advanced technologies and respecting the strictest environmental criteria. For the **onshore section** two different routes in Bulgaria have been under study: one towards northwest and one towards southwest. According to preliminary studies² costs are comparable with the development of the LNG chain (liquefaction plants, ships and re-gasification plants).

This project is an example of a situation where the objectives of a business project overlap with the interests of the governments and populations of several European countries. The Governments of the countries involved in and interested in the

South Stream project have planned to sign a cluster of agreements supporting the initiative of the Italian and Russian companies.

There are many different opinions on **the influence of these investment projects on South – East Europe's economy**. Some regional analysts forecast an era of stability and hospitable investment environment. Not only the energy sector, but many other industries, like tourism, transport, property and construction businesses, could benefit from it. In case these projects bring the necessary capital to the local economies the Balkans could attract the attention of the whole world. Other analysts think that energy interests could lead to political conflicts in the region.

The prognosis of increasing demand for natural gas in the EU over the next 30 years is based on the low carbon content of the natural gas and its inherent environmental advantages. The necessity of diversification of its sources and economic usage can no longer be neglected. The deepening energy import dependence of the EU is obvious – import satisfies 41 % of its oil and 21 % of its gas consumption. 76 % of the oil is imported from OPEC, Russia and the countries from the former Russian Federation (OND) and North Africa.

The EU Internal Energy Market increases the interdependence of Member States in energy supply for both electricity and gas. Despite the targets on energy efficiency and renewable energy, oil and gas continue to secure over half the EU's energy consumption, with import dependence high in both sectors. The prognosis of the EU (over 90 % for oil and some 80 % for gas in 2030). Electricity generation will be heavily dependent on gas.

The growing demand for natural gas in the EU (mainly because of the use of natural gas for

¹ The Memorandum signed in the presence of the Minister of Industry and Energy of Russia, Viktor Khristenko, and the Italian Minister for Economic Development, Pierluigi Bersani.

² Carried out by Saipem.

power generation in combined cycle gas turbines due to decarbonisation) poses the EU the problem of providing stability of gas imports at a reasonable price.

Ensuring external supplies requires negotiations with producer countries. It implies strategic partnerships with gas producing countries like Russia and the development of oil and gas transport and supply networks. The EU could also promote new import routes and expand strategic reserves.

A possible “trap” in respect of **natural gas** is the danger for the EU to grow increasingly dependent on relatively unpredictable supplies in the long-term. Currently gas imports come mainly from Algeria and Russia. EU’s external supply of gas depends on 41 % of imports from Russia and almost on 30 % from Algeria, that’s why geographical diversification of our supplies is obvious. By comparison, Europe’s oil and coal supply is more diversified. In this situation the development of long-term energy partnerships with the key suppliers like Russia is essential.

Electricity generation is and will be heavily dependent on gas. Without a significant technology breakthrough, oil will continue to dominate transport. Therefore, security of supply of these fuels will continue to be paramount to the EU economy.

Gas is competing with oil for being the dominant energy source. In electricity generation gas plays as important a role as oil in transportation. Energy disruptions have considerable influence on the national accounts far beyond the direct cost of market participants.

The present gas supply to the EU depends on too few suppliers and routes. The EU needs a clear and active policy on the “security of gas supply” issue with a strong multilateral direction. The measures developed for the oil industry over the last 30 years could be a starting point for a debate. When discussing security of gas supply it is useful to define the various risks for the EU. Free riders relying on alternative fuels without participating in the EU security systems are not permissible.

Import dependency of Europe is expected to grow from 36 % in 2000 as high as 69 % by 2030. Additional supplies are situated in remote areas and they will also follow complex and potentially risky transportation routes as some 70 % of global gas reserves are located in the Caucasus the Middle East. The EU Energy Policy should work towards:

- ensuring adequate levels of gas storage or alternative back-up fuels;
 - diversifying supplies whilst ensuring a reasonable balance between different supply sources,

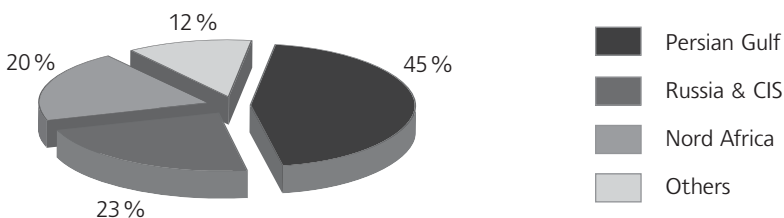


Figure 4. Major oil suppliers for Europe

Source: European Energy Outlook, <http://www.euractiv.com/en/energy>

- providing incentives for new gas supplies,
- the risk of system failure or disruption of the largest natural gas supply source and related costs of such a disruption,
- considering possibilities for cross-border co-operation as well as the importance of long-term contracts and their flexibility.

In October 2000, the EU and Russia agreed to start an Energy Dialogue dealing with issues like security of supply, energy efficiency, infrastructure (e.g. construction of pipelines), investments and trade. Launched at the EU-Russia Summit in Paris in October 2000, this bilateral Energy Dialogue aims at securing Europe's access to Russia's huge oil and gas reserves (the country holds one third of the world's known gas reserves). The dialogue is based on the assumption that interdependence between the two regions will grow – from the EU for reasons of security of supply; on the part of Russia, to secure foreign investment and facilitate its own access to EU and world markets (the EU is responsible for over half of Russia's trade turnover).

Import dependence for oil and natural gas from outside the EU will increase in the forthcoming years and accession countries are not going to change the situation with Norway, Russia and Algeria remaining the main suppliers for the EU but new gas exporting countries (Egypt, Qatar, Trinidad and Tobago) are expected to enter the picture.

2. Renewable energy sources in the European Union energy mix

The development of renewable energy – the energy coming from wind, water, solar power and biomass – is one of the basic objectives of the European energy policy. The main types of renewable sources (RES) include:

- **solar energy and wind energy**, as well as the energy of the atmospheric processes such as cyclones, storms, tornados and hurricanes.;

- **geo- genesis energy** (geo thermal energy; the energy of sea and ocean waves, tides, etc);
- **energy from some chemical reactions** –release of hydrogen, ammonia, carbon oxide and others.
- **energy of bio – chemical processes** – the energy received when hydrogen is released from some plants and seaweeds.

There are several reasons proving the importance of further development and research in this field:

- Renewable energy contributes for reducing the Carbon Dioxide (CO₂) emissions in the air – a major Community objective.
- The increasing share of renewable energy in the energy balance of the EU enhances sustainability.
- RES also improve the security of energy supply by reducing the EU's growing dependence on imported energy sources.

Renewable energy sources are expected to be economically competitive with conventional energy sources in the medium to long term.

In 1997, the EU started to work for a target of a 12 % share of renewable energy in its overall energy mix by 2010 that would mean a doubling of 1997 levels. Since then, renewable energy production has increased by 55 %. Nevertheless the EU will not reach its target. The share of renewable energy is unlikely to exceed 10 % by 2010. The main reasons for the failure to reach the target are the higher costs of renewable energy sources today compared to "traditional" energy sources and the lack of a coherent and effective EU policy framework and a stable long-term vision. As a result, only a limited number of Member States have made serious progress in this area and renewables production is still a niche but not the mainstream.

The EU has to provide a long term vision of the future of renewable energy in the EU, built on the existing instruments like the renewable Electricity Directive. This will help to trigger further in-

vestment, innovation and jobs. The challenge for renewables policy is to find the balance between installing large scale renewable energy capacity today, and waiting until research lowers their cost tomorrow. Finding the right balance means taking the following factors into account:

- Using renewable energy today is more expensive than using hydrocarbons, but the gap is narrowing – particularly when the costs of climate change are factored in;
- Economy of scale can reduce the cost of renewable energy but this requires major investment today;
- Renewable energy helps to improve the EU's security of energy supply by increasing the share of domestically produced energy, diversifying the fuel mix and the sources of energy imports and increasing the proportion of energy from politically stable regions as well as creating new jobs in Europe;
- Renewable energies emit few or no greenhouse gases, and most of them bring significant air quality benefits.

After an impact assessment study, the European Commission has proposed in its Renewable Energy Roadmap a target of increasing the level of renewable energy in the EU's energy mix from less than 7 % today **to 20 % by 2020**. Targets beyond 2020 would be assessed in the light of technological progress.

Meeting the 20 % target requires a growth in all three renewable energy sectors: electricity, biofuels and heating and cooling. The policy frameworks in some Member States have achieved results which show how this is possible. Renewables have the potential to provide around a third of the EU electricity by 2020.

Today wind power provides approximately 20 % of the electricity produced in Denmark, 8 % in Spain and 6 % in Germany. Costs in other new technologies – photovoltaic, solar thermal power, and wave & tide, are projected to decrease from currently high levels.

In the heating and cooling sector, progress is a result of a number of new technologies. Sweden, for example, has over 185 000 installed geothermal heat pumps. Germany and Austria are leaders in the solar heating. If other Member States reach their levels, the share of renewable energy in heating and cooling would jump by 50 %.

As for biofuels, Sweden has already achieved a market share of 4 % of the petrol market for bioethanol, and Germany is the world leader for bio-diesel, with 6 % of the diesel market. Biofuels could provide up to 14 % of transport fuels by 2020.

Major concern of the EU is the fact that acquisition of the European structural and cohesion funds will increase the CO₂ emissions and will therefore hinder the Union's combat with climate changes. The Member States have to draw up national action plans to achieve 1 % yearly energy savings in the retail, supply and distribution of electricity, natural gas, urban heating, and other energy products including transport fuels. Spain, Portugal Greece and Ireland have considerably increased their CO₂ emissions after their accession to the EU. Poland is expected to receive 20 % of the Structural funds for the period 2007 – 2013 and to increase its CO₂ emissions by 31 % until 2013. The new Member States plan to invest mainly in road transport infrastructure and insignificantly sponsor railway and marine transport. The number of vehicles has increased dramatically in the new member states and for example the Czech Republic and Lithuania have more cars per capita than wealthier countries like Denmark.

The 20 % target is truly ambitious and requires major efforts by all Member States. The contribution of each Member State will have to take into account different national circumstances and starting points, including the nature of their energy mix. Member States should have the flexibility to promote the renewable energies most suited to their specific potential and priorities.

The way in which Member States will meet their targets should be set out in National Action Plans to be notified to the Commission. The Plans should contain sector targets and measures consistent with achieving the agreed overall national targets. Implementing their Plans Member States will set their own objectives for electricity, biofuels, heating and cooling, which would be verified by the Commission to ensure that the overall target is being met. The Commission plans to prepare a new renewables legislative package in 2007.

A particular feature of this legislative framework is the minimum development of biofuels throughout the EU. Today and in the near future biofuels will be more expensive than other forms of renewable energy, but over the next 15 years they are the only way to significantly reduce the oil dependence in the transport sector. In its Renewable Energy Roadmap and Biofuels Progress Report, the Commission proposes a minimum target for biofuels of 10 % of vehicle fuel by 2020.

The EU currently meets 5 % of its energy needs from biomass. In case of full use of its potential, the EU would more than double the biomass use by 2015. The increase in biomass use could bring the following benefits:

- diversification of Europe's energy supply, increasing the share of renewable energy by 5 % and reducing the energy import from 48 to 42 %
- a reduction in greenhouse gas emissions of 209 million tonnes CO₂ eq per year;
- direct employment for up to 250-300 000 people, mostly in rural areas.
- potential decrease in the oil price as a result of the lower demand for oil.
- extending the EU's technological leadership in the sector of renewable energy.

Biomass should be produced in compliance with good agricultural practice, safeguarding sustainable production of biomass and without significantly affecting domestic food production. Bulgaria

and Romania's accession improves availability of biomass because Bulgaria and Romania each have 0.7 hectares of agricultural land per capita, compared to 0.4 in the EU-25.

Biofuels are a credible alternative to oil. In most Member States the diesel that motorists buy already includes biodiesel in low blends. Major oil companies undertake biofuel investment programs for millions of euros and vehicle manufacturers have begun marketing cars running on high bioethanol blends.

There comes however another type of problem with the usage of biofuels. If we take corn for instance – the quantity necessary for the production of a 25 gallon tank of the bioethanol biofuel, is enough for the nutrition of one person for one year. European Governments do not control biofuels production and there is high investment in the sector because of the rising traditional fuel prices on one hand and the high profits of biofuels production on the other. If that trend continues, we might reach to a phase when there won't be agricultural products available for farm animals breeding (the only source of meat, milk and eggs). Highest level of competition for the same biomass is observed in the case of the maize corn, sugar beet, sunflower and all types of corn.

Governments should introduce relevant measures to take control of the situation and give licences for the biofuel production. Otherwise the increase of corn prices could bring the poorer countries into economy crises and instability. The solution of this problem could be diversifying the energy sources and wider introduction and implementation of the renewable energy sources.

3. Opportunities and threats for the energy policy of the EU

Europe's major problem is to find a way to decrease its energy sources import dependence. If the EU to succeeds in meeting the objectives re-

garding energy efficiency and renewables, this will put it on track to meet the 2020 greenhouse gas reduction of 20 %, and provide a springboard to achieve dramatic reductions according to the 2050 objectives. Determined action requires timely investment, new jobs and a technological lead for Europe in low carbon technologies. **The EU could set the pace for a new global industrial revolution.**

The Green Paper "Towards a European Strategy for the Security of Energy"³ adopted in November 2000 by the European Commission focuses on the growing dependence of the EU on external supplies of energy. It draws attention to structural weaknesses as well as geopolitical, social and environmental shortcoming of the EU's energy supply, notably with regards to EU commitments in the Kyoto Protocol. Furthermore, it identifies two main priorities:

- i) controlling the growth of demand and
- ii) managing supply dependence in Europe.

The submissions received during the Green Paper consultation period, have shown that this situation cannot continue. A coherent series of measures now need to be taken with the objective of creating a European Gas and Electricity Grid and truly competitive European-wide energy market. A particular feature of this framework is the need for a minimum and coordinated development of biofuels throughout the EU.

The EU should engage third countries and their producers to achieve these goals. The 2007 renewables legislative package includes measures to facilitate the market penetration of both biofuels and heating and cooling from renewables. The Commission also plans to intensify the use of renewable energy through other policies.

And, of course, there is an important question – how much will it cost to implement this global strategy? To achieve a 20 % share for renewables will cost annually approximately € 18 billion –

around 6 % of the EU's total expected energy import bill in 2020. But this assumes oil prices of \$ 48/barrel by 2020. If prices rise to \$ 78/barrel, this average annual cost will fall to € 10.6 billion. If a carbon price of more than € 20 is factored in, the 20 % objective will cost practically no more than relying on "traditional" energy sources, but create many jobs in Europe and develop new, technology driven European companies.

The EU has two objectives for energy technologies: to lower the costs of clean energy and to put EU industry at the forefront of the rapidly growing low carbon technology sector. To meet these objectives, the European Strategic Energy Technology Plan outlines a long term vision of moving towards a low carbon energy system in a competitive manner.

The EU cannot achieve its energy and climate change objectives on its own. The EU in the future will account for only 15 % of the world's CO₂ emissions. By 2030, with the new objectives, the EU will consume less than 10 % of the world's energy. The challenges of security of energy supply and climate change cannot be overcome by the EU Member States acting individually. The EU has to work with both developed and developing countries, energy consumers and producers, to ensure competitive, sustainable and secure energy.

The EU must pursue these goals forming effective partnerships and translate them into a meaningful external policy. Energy policy must become a central part of all external EU relations – it is crucial to geopolitical security, economic stability, social development and international efforts to combat climate change. The EU must develop effective energy relations with its international partners, based on mutual trust, cooperation and interdependence – relations should be broadened in geographical scope, and deepened on the basis of agreements with substantial energy provisions. **VIA**

³ COM (2000) 769, Towards a European Strategy for the Security of Energy, Green Paper.