

Report on VIII International Conference

POWER RING 2012

*Options for ensuring energy security and promoting investments
in low-emission power sector*

14 December 2013, Ministry of Economy, Warsaw

ORGANIZATORZY / ORGANISERS:



WSPÓŁPRACA/COOPERATION:



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General postulate: Energy efficiency improvement and prosumer energy will increase Poland's energy security. There is an urgent need to revise the country's energy policy and, in particular, to determine its target energy mix including, inter alia, prosumer energy, shale gas and nuclear power.

The conference organisers: **ETA Association for Efficiency and E. Kwiatkowski Institute** (patronage: **the Public Board of the Development of Low Emission Economy**), together with the invited experts undertook an attempt to determine Poland's low-emission economy objectives in view of the European energy and climate policy. The need for the analysis and discussion was connected with the preparation, by the Ministry of Economy, of the so-called energy tri-pack of legislation which will shape the country's energy policy until 2050. Therefore, the leading topic of the discussion was "Options for ensuring energy security and promoting investments in low-emission power sector". For the first time the Power Ring conference was the venue for presenting the newest edition of the International Energy Agency's report *World Energy Outlook 2012*. The report was presented by **Maria van der Hoeven, Executive Director of the International Energy Agency**. Power Ring 2012 was also the first official occasion for **Janusz Piechociński**, Poland's new **Deputy Prime Minister and Minister of Economy**, to present the energy policy directions set out by the Ministry of Economy.

During the four sessions of the conference, the following topics were discussed:

- EU energy policy – including, in particular, new legal regulations on shale gas extraction, support to cross-border connections, and imported fuel price formulas;
- European energy market development directions (fossil fuels, gas, electricity and heat - technologies, investment projects, market trends, implications for the sector and for end-users);
- Poland's policy on low-emission investments, and the National Investment Plan;
- The role of the construction sector in the development of low-emission economy.

The panel discussions were moderated by famous journalists from TVN CNBC, Polsat News, and the Warsaw Voice. Keynote address was presented, inter alia, by **Marcin Korolec**, Poland's Minister of Environment.

The conference was attended by 39 speakers/panelists, 470 participants and 70 representatives of the media. In addition, the conference was broadcast live on the websites

of important opinion-building media (eg. Dziennik Gazeta Prawna, Ekonomia24 – Rzeczpospolita, Newseria, CIRE and Nowa Energia) and on other websites including those of the Ministry of Economy, Energy Regulatory Office, the Public Board for Development of Low-Emission Economy, ETA Association for Efficiency, and Procesy Inwestycyjne. During the live streaming, the conference was watched by about 36 thousand Internet users. In addition, during the event, TVN CNBC operated its mobile studio and the conference had its own Conference TV Studio; both studios provided live broadcast, on TVN CNBC and the Internet, of the discussions with experts participating in Power Ring.

Power Ring 2012 ensured a thorough substantive discussion between experts and politicians on changes in the Polish energy policy, necessary for maintaining the competitiveness of the Polish economy.

During the conference, a special open session of the Public Board for Development of Low-Emission Economy was also held. It presented to-date achievements of the Board as well as the advancement of works on the National Programme for Low-emission Economy Development. The Board's special guest spoke about the district heating sector and its issues related to bio-mass co-incineration.

THE CONFERENCE'S OPENING SPEECHES

Janusz Piechociński, Deputy Prime Minister and Minister of Economy of Poland

The International Conference POWER RING 2012 was opened by the newly appointed Minister of Economy Janusz Piechociński. He expressed his satisfaction with the fact that the conference for the eighth time was held at the Ministry of Economy. He also assured that the Ministry is open to the exchange of views and cooperation regarding the energy sector which is of great importance for the security of the state. Deputy Prime Minister expressed the hope that the discussions held during the conference would make it possible to determine further development directions for the European energy sector within which Poland, given its potential, is a major player. Our intention is to utilise the potential of renewable energy sources and to encourage Poles to participate in the efficient energy consumption programme, he added. According to Minister Piechociński, the main objective is to ensure affordable, low-level competitive prices of energy to the Polish economy and consumers. In closing his speech, the Minister of Economy pointed out that for the seventh time already, the International Energy Agency's annual report *World Energy Outlook* was presented in Poland. Minister Piechociński requested the participants to pay careful attention to the report's contents and to actively participate in the discussions. Given that the panelists of the individual sessions represent different professional communities and experience, the conclusions of the conference should be of great value, he concluded.

Prof. Jerzy Buzek, Chairman of the Public Board for Development of Low-Emission Economy

The Board's chairman Jerzy Buzek opened his speech by reminding of three main challenges facing the Polish energy sector: security of supplies, environmentally friendly production of electricity, and energy prices at the lowest possible level. Due to the long period of not investing in new generation capacities, as well as relevant EU regulations which require our country to decommission outdated and inefficient power plants, Poland is currently in a very difficult situation, said prof. Buzek. He reminded of serious difficulties with balancing energy supply and demand, and added that prosumer energy, energy import and activities within urban systems may make it easier for Poland to go through this difficult period.

According to prof. Jerzy Buzek, there is an urgent need for developing a scenario for Polish economy's transition to a low-emission economy. Such a scenario should ensure a continued dynamic development of the Polish economy. Europe is implementing the process of creating a common energy market, he added. The process is to be completed in 2014. He stressed that this is a significant opportunity for the Polish energy sector. He also spoke about changes connected with the provision of support to the development of new technologies, in cooperation with the National Centre for Research and Development which will fund energy-related projects. Starting from this year, it will be obligatory to involve the industry in relevant research activities carried out. Another change relates to the Eighth Framework Programme named Horizon 2020. A separate programme, largely dedicated to innovation, has been designed for SMEs, he added. Overall, the support will be extensive and will amount to approximately 3-4 billion euro. Polish energy companies will have to compete on the common European energy market so it is of importance to make the best use of the support programmes, he concluded in the first part of his presentation.

According to prof. Buzek, Poland may attempt to pursue the common European goal relating to greenhouse gas emissions reduction by 20% by 2020, but only provided that the attitude of the Polish energy sector is changed and that funds for new investment projects are ensured. To this end, however, the new Polish Energy Law is necessary, he stressed. The current law which entered into force 15 years ago is outdated and inadequate to the challenges of the present times. Then prof. Buzek indicated several important elements which, in his opinion, should be taken into account in the new Energy Law. Firstly, it should be regulatory stability in domestic policy, which is conducive to the inclusion of Poland in the Third Climate and Energy Package. Secondly, the country should conduct intelligent economic policy promoting the use of new technologies both in the power sector itself and in the construction of power networks, thus enabling the development of prosumer energy in Poland. We should also remember about the competitiveness aspect, he added. In Poland, there are now four large power-sector companies while on the open European market the situation is different. Therefore, there is a need to strengthen the Polish companies, he stressed. In the next part of his speech prof. Buzek pointed to the need for considering a change in the business model of power sector companies. He mentioned that the companies are going to face new challenges imposed by the European energy market regulator.

According to the Chairman, if the new Polish Energy Law takes into account the above suggestion and if a stable energy policy for the next 20 years is set out, the banking sector and financial institutions will be more likely to support investments in the power sector. Without their support, the transformation of the power sector in our country will not be possible, he summarised.

At the end of his presentation prof. Buzek asked the participants to perceive the thresholds imposed by the Climate Package as a chance for the development of the Polish power industry based on local sources such as shale gas and renewable energy sources.

SESSION ONE – Energy policy

Keynote speech: World Energy Outlook 2012 – report of the International Energy Agency - presentation by Maria van der Hoeven, Executive Director of the International Energy Agency

Maria van der Hoeven began with a brief description of the changes that have taken place over the past year in the power sector across the world. They mainly concern the United States which have started to use gas, including unconventional gas, in the power sector on an increasing scale. Another change relates to Iraq which continues to increase its oil production. In addition, many countries such as Japan, Germany, Switzerland and France have decided to withdraw from the production of nuclear power, she added. IEA Executive Director also pointed to the disadvantageous trend in energy prices which have already exceeded even the oil prices from 2008. Currently, an oil barrel is as much as 100 dollars which has a negative impact on the global economy. Another problem is the prices of gas in Europe, which compared to those in the United States and Asia are still very high, she said.

In the next part of her presentation Director Maria van der Hoeven mentioned some pessimistic facts. The first of these concerned the fossil fuel subsidies which in 2012 increased by almost 30%, which contributed to a significant increase in carbon dioxide emissions, by about 1 Gt in 2011 which so far has been the highest level in the history. In addition, 1.3 billion people in the world still have no access to electricity. Water used in the power sector makes up 15% of overall water consumption and, according to forecasts, will soon make up as much as 20%, she stated. These facts indicate that the world is unable to implement a more sustainable energy policy, she regretted. The global demand for energy is constantly growing. IEA forecast says that by 2035 it is going to increase by one third. Most of the growth is going to take place in China, India and the Far East. Looking at the global energy mix we can see that the share of renewable energy sources is increasing. Yet, fossil fuels which generate large emissions and thus escalate the global warming effect are still dominant. This negative phenomenon causes our constant concern, she concluded.

Then, Maria van der Hoeven discussed in more detail the changes that are taking place in the global energy market. She started with the situation in the United States which, using state-of-the-art technologies, invest in unconventional gas. According to IEA expectations, by 2020 the United States are going to be the largest global producer of oil and gas. The energy

sector transformation in the United States is so significant that its effects are going to be felt all over the world, she emphasized. Unconventional gas revolution will spread also to other countries such as Canada, Australia, Argentina, Poland and Ukraine. Lower gas prices in the United States are going to increase the prices of coal. Another change relates to Iraq which is going to become a significant producer of oil, primarily because of exceptionally low production costs which are, e.g., about 15 times lower than in Canada. This gives Iraq a huge advantage in the market, she said. The direction in which the Iraqi oil is exported is also of importance, she added. Currently, the exports are divided fifty-fifty between Asia and the rest of the world but in the future Asia's share will increase significantly. All the changes in the oil market will bring about reorientation of oil production and its forwarding direction in the next few years; however, it is difficult to say how this will affect the global energy policy, she concluded. In Europe, imports of crude oil continue to decline which indicates to EU's new member states such as Poland that energy efficiency is the key to ensuring energy security.

The next part of the presentation of this year's edition of IEA's annual report was devoted to the situation in the gas market. Maria van der Hoeven noted that in contrast to other fuels, for gas there is no major market. There exist three parallel markets: Europe, America and Asia-Pacific. Each of these markets has its own characteristics and prices strongly different from those in the other markets. Thanks to the revolution connected with unconventional gas, prices in the United States are currently the lowest. IEA forecasts say that in the future, the three markets will be joined. Until 2035 gas trading is going to be more diverse, and the market more competitive. The focus point is likely move to the east, and the demand for gas will increase. Russia, a partner of Poland, is a major exporter of natural gas, primarily to Asia. Increasingly important will be the role of unconventional gas which will account for 50% of the gas market increase, she added. After 2020, the production of unconventional gas in Europe will grow thanks to shale gas deposits. Half of that production is expected to come from Poland. Maria van der Hoeven remarked, however, that the predictions are not certain because everything depends on the amounts of the resources, and their estimations are very different.

Then, Maria van der Hoeven proposed to look at the common picture of the gas and oil markets. She noted that despite the increase in the share of unconventional gas, until 2035 all countries with major roles in the global energy market will still be dependent on oil imports. Gas imports will increase as well, so unconventional gas will trigger changes in all the three markets and will impact energy security of many countries. The situation is different in the case of the United States where imports will decrease and the country may even become an exporter of gas, she concluded.

The next part of the report's presentation concerned the production of electricity. Currently, it is produced mainly from coal but Maria van der Hoeven expressed her hope that renewable energy sources will soon begin to play a greater role. Europe and Japan are the regions where the share of renewable energy sources in energy mix is gradually increasing. Russia will continue to rely on gas. However, by 2035 India and China will be the countries using most varied sources of energy, including renewables, she stated. Despite large-value grants, the technology price decrease and the rise in fossil fuel prices, still more money is needed to create more opportunities for using renewable energy, she stressed. This, however, should not discourage Poland from investing in renewable energy sources, she reassured, because the country's potential in this area is large. She encouraged the Polish government to support the development of renewable energy sources so that it does not trigger additional costs for consumers.

Each year, the IEA report focuses on one type of fuel. In 2012, emphasis was placed on energy efficiency whose potential for energy market change is enormous, said Maria van der Hoeven. There are many opportunities for Poland too. Energy efficiency is a key part of its energy strategy until 2030. Unfortunately, even if most countries opt for similar energy policies, 2/3 of the energy efficiency potential will still remain unused, she regretted. In the case of the European Union, energy efficiency is a key option for reducing energy imports. It will also bring savings to consumers. Energy efficiency is simply very profitable. It also has a positive effect in the form of pollution and emissions reduction, she summarised.

In concluding her speech, IEA Executive Director assured that the European Union will remain one of the major players on the energy market but at the same time she stressed that the situation in the world is constantly changing. Therefore, Poland's and Europe's energy policies have to react to the global changes. According to Maria van der Hoeven, there is only one choice for Poland and the world: to achieve the energy efficiency objectives.

PANEL DISCUSSION

EU Energy Policy - new regulations regarding shale gas; support to cross-border connections; price formulas for imported fuels; cross-border connections; energy cooperation with Russia and Ukraine.

In 1970s, the Club of Rome report forecasted that energy resources would expire in a short time but, as it soon turned out, the situation was not that bad. According to the presentation, by 2035 the demand for energy will increase by one third. United States conduct a reasonable energy policy in order to ensure cheap sources of energy for the country. In

Europe, the situation is different because, for instance, nuclear power is being abandoned. Will it not be a strategic problem for Europe?

Maria van der Hoeven, Executive Director of the International Energy Agency

Maria van der Hoeven agreed with the above statement. She admitted that at the global level there is a huge demand for energy so Europe will have to face the problem of security of energy supplies. Therefore, the European energy policy must be strengthened, she noted. We should take into account both the conventional and unconventional sources, she added. She also expressed the hope for strong benefits coming from cross-border cooperation, in particular with regard to the electricity market. She pointed to the example of Germany where electricity produced from wind needs to be transported from the north of the country to its central and southern regions; to this purpose, Polish and Dutch grids are used.

Apart from importing gas from Russia, will Poland also buy Russian electricity? Is the Russian side technologically and politically ready for such a solution?

Boris Mechanoszin, International Director, Power System of Russia

Director Boris Mechanoszin began his presentation by giving a brief outline of the situation in the Russian power sector whose main problem is large losses on transmission. He pointed to the fact that each year electricity consumers have to pay about 4 billion euro to cover the losses. He added that all nuclear power plants work just to compensate for the losses on distribution. The solution to the problem, according to Mr Boris Mechanoszin, is switching to a higher voltage level i.e. from 0.4 to 15 kV. Only then it will be possible to extend the grid and improve the efficiency of the energy sector, he concluded.

Then he referred to the question asked by the panel moderator. He assured that Russia has extensive possibilities regarding cooperation with the neighbouring countries, and has substantial experience in this field. He reminded that in 2008 the Russian Federation and the European Union carried out a study on the possibilities of cooperation within the framework of a single synchronized system. The results were interesting yet showing that the benefits do not outweigh the risks. Therefore, several markets should necessarily be involved in such operations which, in turn, requires strengthening of cross-border infrastructure, he added. Asked how the Russian side could cooperate with power suppliers in Europe, Boris Mechanoszin replied that Russia could be a storage centre for surplus wind-power produced in the European Union. In concluding his speech, Director Mechanoszin assured that Russia is ready to cooperate with others. It willingly offers its participation in various projects and

works on developing new business scenarios for the partners from Norway, Finland and Poland.

Are we technologically ready to import electricity from the eastern and other neighbouring countries? Do we have cross-border connections and what investments are still required in the Polish power grid?

Henryk Majchrzak, President of the Board, PSE Operator

President Majchrzak reminded that, despite the economic slowdown, peak power demand continues to grow and the real reserve capacity of the national system is about 2500 MW which makes up only 10% of the demand. This means that, although the system can be balanced, there is no excess safety margin. This is probably the best answer to the question whether or not cross-border connections are needed, he concluded. The National Energy Policy until 2030 assumes that in 2020 Poland should be able to exchange about 20% of its electricity (consumed within the country) with the neighbouring countries, he added. Electricity which is subject to cross-border trading becomes an object of the market play. Opening the doors for external competitors may bring a decrease in energy prices, he stressed. The second reason, important the point of view of the operator, is the possibility of mutual support provision between the neighbouring systems in the case of any problems; this would contribute to improving energy security in Europe, he concluded.

Then, President Majchrzak briefly outlined the current situation in cross-border transmission of electricity. He pointed to the fact that the current capacities in terms of power imports include only 600 MW from Sweden and 200 MW from Ukraine. This is a fraction of the national grid's demand amounting to 25 000 MW in the peak time. The export potential is not much greater, and amounts to 1000 MW, he added. Unfortunately, Poland is a country with relatively weak cross-border connections, he complained. Despite the large coal reserves and the interest of the neighbouring countries in importing energy from Poland, export possibilities are very limited. However, he expressed his optimism about the future and presented new investment projects which could change the negative picture. Works are underway to regulate the relations with Germany which has problems with wind power balancing and transport from the north to the south of the country. An advanced dialogue is also ongoing with a German operator on the joint construction of phase shifters allowing to increase the import capacity of the National Power Grid by 500 MW across the overall synchronous system (ie. connections with Germany, the Czech Republic and Slovakia jointly), and export capacity by 1500 MW. Another project provides for the construction of the third connector to Germany. EU funding has already been obtained for study works within the

project, he added. This will increase the National Power Grid's import capacity within the synchronous system by 1500 MW and the export capacity by 500 MW. Another large European project, now almost at the stage of implementation, concerns the connection of the Polish power network to the Lithuanian power network. By the end of 2015, cross-border transmission at the level of 500 MW will be possible. At the second stage, the capacity will be increased to 1000 MW. The third project involves the reconstruction of the currently inactive connection between Rzeszów and Chmielnicka (Ukraine). President Majchrzak assured that the Ukrainian side is satisfied with the import to Poland at the level of 200 MW, which, thanks to the efforts of PSE was restarted at the end of 2011. There is a chance for increasing the capacity up to 500 MW in the next 2-3 years.

President Majchrzak concluded his speech by stating that the construction of cross-border connections is a topical issue in the European Union. It is a profitable direction, creating an opportunity to boost the competitiveness of Poland and strengthen energy security of the country, he concluded.

Up to now, the prices of gas imported from Russia were connected with oil prices. Is PGNiG negotiating a new pricing formula that is already used in the western countries?

Marcin Lewenstein, PGNiG

Marcin Lewenstein admitted that price formulas are the most sensitive issue related to the gas sector in Europe. For all countries, the relations with gas exporters such as Russia, Norway or Algeria are very complex. Fortunately, it has been possible to make use of the changes in the global gas market, thanks to which the prices of gas imported from Russia could be changed, he added. They have become closer to those used in the more developed EU countries, which does not mean a total abandonment of oil-indexed pricing, he stressed. This process will continue for at least a few more years, he concluded.

Marcin Lewenstein referred to the fact that gas has recently become a very attractive fuel, fitting every scenario of development of the European energy sector. The United States, thanks to their unconventional gas deposits, may become a potential exporter of electricity and gas. This change, combined with the European Union's many years of work on market development for the power and gas sectors and with the pressure on environmental protection has resulted in gas being the first-choice fuel for many investors, also as a primary energy carrier and a fuel for the power sector, he said. He added that unconventional gas is also a large chance for the development of the Polish economy. According to Marcin Lewenstein, we should cooperate on this issue with other countries from the region, such as Lithuania and Ukraine, which also see a chance in the utilisation of unconventional gas

deposits. This would make it possible to create in Central Europe an attractive place for investment by foreign companies, because only large investments would make it possible to achieve an adequate scale necessary for the development of unconventional sources, he concluded.

Is the legal system in Poland coherent and does it promote investing in shale gas in Poland? Will it attract foreign partners? What are the prospects for PKN Orlen and other companies exploring shale gas in Poland, and how do they co-operate with foreign partners?

Piotr Chelmiński, Member of the Board for Petrochemical Industry, PKN Orlen

Piotr Chelminski expressed his optimistic approach with regard to shale gas. In his opinion, it is a major opportunity both for Poland and for PKN Orlen as an active operator in the sector. However, as regards this field, many aspects still need to be explored and clarified, also in the area of regulatory issues, he reminded. The currently binding Geological Law enacted in 1990s includes no reference to gas production from unconventional sources. Consequently, many activities conducted by the company are of pioneering nature, he said. In connection with shale gas deposits Poland can, however, achieve many benefits, noted Mr Chelmiński. The estimates by the Centre for Social and Economic Research, presented in a report prepared for PKN Orlen indicate that the implementation of the accelerated scenario of shale gas extraction in Poland may generate more than 500 thousand new jobs, a GDP increase by 0.08 percentage points and a tax stream at the level of 87 billion zlotys, he stressed. He also admitted that the extraction of shale gas is a new area of activity for the company. Therefore, it is necessary to cooperate with scientific research institutions and to invest in research projects. In the conclusion of his speech he emphasized again that the sooner the industry-friendly legislation is adopted, the better for the Polish mining sector, particularly that the United Kingdom is also liberalising its mining law so we should be prepared for string competition.

Marcin Lewenstein, Polskie Górnictwo Naftowe i Gazownictwo

Marcin Lewenstein added that technology issues will have a significant impact on the speed and scale of the extraction works. He noted that an important factor which may become a catalyst for new technology works is the Blue Gas programme under which Polish companies will cooperate with the academic community on developing the new mining technologies. He also mentioned that one of PGNiG companies will seek capital in the stock market to raise funds for new drilling equipment and thus speed up the exploration of unconventional hydrocarbons.

What is the situation with regard to power trading in two different markets, which is important in the case of cross-border connections? How can gas exchange situation translate into the situation of energy consumers? Will gas be cheaper?

Ireneusz Łazor, President of the Board, Polish Power Exchange

Starting his speech, the President of Polish Power Exchange asserted that common prices on the two neighbouring markets in Poland have been in use since December 2010. He quoted the latest intraday market prices per 1 MWh which were: € 50 in Poland, €68 in Sweden and €72 in Germany. As seen, the Polish power is currently the cheapest, he stressed. When asked whether Poland is in line with the common energy market model implemented until 2014, President Łazor confirmed that this is the case. He reminded that the connection with Sweden is already operative and that there is a large chance for launching market coupling with Slovakia, the Czech Republic and Hungary next year, he added.

According to Mr Łazor, the most important task facing the Polish Power Exchange is the launching of the common power market by the end of 2014. Currently, infrastructure development works connected with the transboundary connections, and works on the trading settlement logistics are being completed, he enumerated. However, he cooled the optimism by admitting that the launch of the common power trading platform will be delayed. It is necessary to integrate several large markets and to set a common price for the whole of Europe, he reminded. He admitted that things are not working perfectly, especially in the field of legislation. The power market is specific and it is not possible to directly transpose the regulations of the financial market to the power market, he concluded.

President Łazor also referred to the opening of the Gas Exchange. 31 December 2012 is the planned starting day of next-day market trading which is very important given the possibility to react to market non-balancing. Potential participants in the market are already known but certainly the dominant entity will be PGNiG, stated President Łazor. He admitted that in the starting days no large volumes are expected but it is more important to indicate the starting point i.e. to set the reference price so that every next transaction can be easier, he added. He also noted it was helpful to have negotiated with Gazprom the prices similar to those in use in western EU countries . This gives a chance for greater volumes in the future.

By 2030 Iraq is going to be the largest exporter of oil. Will it also develop other sectors?

Saad A.W. Jawad Kindeel, Ambassador of the Republic of Iraq to Poland

Mr Ambassador began his presentation by outlining the current situation of the oil and gas sector in Iraq. In 2006, oil production volume amounted to 2 million barrels per day, and since 2007 there has been a continuous increase in the production by 10% on average. The current volume is 3.4 million barrels per day out of which 2.9 million barrels are exported. Mr Ambassador expressed the hope that if the upward trend is maintained, by 2020 Iraq may achieve the production level of 6.8 million barrels per day. The increase has been taking place thanks to the improved security, new investment projects totalling USD 4 billion and the government's financial support to the energy sector, amounting to about 25 billion USD per year, he explained. Iraq plans to continue its policy throughout the next decade, he assured.

According to the Ambassador of Iraq, political stability in the country may contribute to significant economic revival and accelerate new investments in the reconstruction of infrastructure, for which the overall amount of USD 500 billion has been planned. The key sectors include transport, energy and oil export capacity. If the investments are implemented, by 2020 Iraq will be able to increase its oil production to 10 million barrels per day, he emphasised .

At the end of his presentation Mr Ambassador gave the data according to which Iraq's official oil reserves amount to 115 billion barrels and the identified but unexplored reserves amount to further 145 billion barrels. He reminded that only 10% of Iraq's total area has been explored for oil and gas. Thus, according to the latest forecasts the reserves could be as high as 215 billion barrels which gives Iraq the first place in the world in terms of oil reserves, he concluded.

Questions by the Conference participants and Internet users:

Does Poland plan to launch any smart energy projects?

Henryk Majchrzak, President of the Board, PSE Operator

According to President Majchrzak, the construction of intelligent networks in Poland has become a reality. Energa, Tauron and other companies are already running large-scope pilot projects in this field. They include the replacement of meters as well as the provision of access to various applications via which the data generated by the meters can be used in different ways, he added. He reminded, however, that to be able to talk about a smart grid in Poland we should start from energy generation. It is necessary to look for sources which allow rapid reaction adequate to the variability of generation from renewable sources, in order to balance the system. The question should also be answered how to better utilise the existing infrastructure. Attention should be paid to issues related to consumers, such as new

meters, power generation by consumers from renewable energy sources, electric vehicles and charging stations for them serving the purpose of energy storage, he concluded.

What savings can be achieved thanks to the smart grid? What is their scale?

President Majchrzak assured that the savings and benefits will be large. This is shown by pilot programmes and experience of other countries. The installation of a smart meter by itself translates into a reduction in power consumption by over ten percent. This is achieved thanks to the fact that consumers can easily monitor their energy consumption online, on the continuous basis. In addition, experience of other countries shows that using properly designed tariffs and price lists, thanks to appropriate energy management by consumers they can reduce their peak demand by up to 30%. This effect is of great benefit for the power system.

Does Russia have any experience in implementing smart grids? If so, have any savings been achieved yet? What are the investment plans in this field?

Boris Mechanoszin, International Director, Power System of Russia

Director Boris Mechanoszin confirmed that Russia has an investment programme relating to smart grids, and added that it covers several directions of activities. The first of them is smart metering which allows consumers to control their energy consumption. In 2012, in the southern part of the country about 600 000 smart meters were installed. The region was not selected randomly, he stressed. It was selected as before there existed no system of energy metering, and therefore the scale of the project had to be so large. Savings are already visible, he assured. Customers save electricity and calculate its consumption. The other directions of activity are related to intelligent planning of transmission networks, the use of renewable energy sources and the creation of rotating reserves to balance the power system, enumerated Director Mechanoszin. In concluding his speech he also mentioned the rarely discussed issue of natural disasters and their consequences for power networks. In his opinion, it would be of benefit to invest also in the strengthening of the infrastructure to protect it from negative weather impacts.

When will it be possible to buy electricity at prices used in the neighbouring countries?

Wojciech Hann, Partner, Deloitte

Mr Wojciech Hann noted that indeed in some European markets the prices of electricity and gas are lower than in Poland. He reminded, however, that these are often the prices of electricity from wind sources, whose producers base their economic calculations on support

systems. Lower energy prices are the resulting prices, and a part of the actual total price is covered by taxpayers, he cooled the enthusiasm. In his opinion, low price of electricity, although ensuring customer satisfaction, is not the best option for long-term construction of production capacities. In the energy market there exists a conflict between short-term prices in the stock market and the overall costs of production, which have to take into account the investment outlays, he stressed. This is an important problem for all liberalised power markets, he added. Investments in new production capacities are necessary in Poland. Thus, the question should be asked how to set the prices in the long term so that the investments can be implemented, irrespective of the technology used, he concluded. In the UK, the issue has been under discussion for several years already. Numerous ideas have been proposed, one of them being the guaranteed minimum prices of carbon dioxide emissions as a method of stabilising power prices. The introduction of differential contracts is also being considered, he stated.

In concluding his presentation, Wojciech Hann repeated that the conflict between short-term price based on incremental costs of production and the overall production costs taking into account the investment outlays, will always exist in the market. Therefore, a sensible approach is necessary to the question: what energy mix should be adopted by Poland, and the policy should be adjusted accordingly. In his opinion, investment in production assets are strongly required. It is not possible to pay low prices without saving energy at the same time, he warned. The only method of lowering energy prices is energy efficiency, he concluded.

The industry's migration to places with lowest energy prices and production costs. How serious is the problem, and how should it be dealt with?

Maria van der Hoeven, Maria van der Hoeven, Executive Director of the International Energy Agency

Director van der Hoeven agreed with the statement that the strict policy of the European Union in the field of emissions reduction will, in fact, result in their "leakage" to other countries. She assured, however, that the EU plan for 2020 envisages that industries such as the power sector will have a certain degree of freedom in shaping the aspects related to competitiveness. A certain amount of emission limits has been gathered, and this fact significantly reduces the risk of emissions' export, she added. However, she admitted that the reversal of the global trends in the energy sector, presented in the report, will have a significant impact on the competitiveness of the industries whose major part of the costs are those associated with electricity.

We do not want regulations from Brussels. Instead, we want a free power market from Morocco up to Norway.

Ireneusz Łazor, President of the Board, Polish Power Exchange

President Łazor assured that such a market is already operating to a certain extent, and is free and competitive. Yet, in order to function properly, the market needs to be transparent, and regulated and supervised to some extent, he added. The power system is the bloodstream of the whole country and thus it needs to be protected against pathologies. Unfortunately, experience of other liberalised markets shows that pathologies do exist, he concluded.

SESSION TWO – Power market

Keynote speech: Poland vs. European Energy and Climate Policy - prof. Krzysztof Źmijewski, Secretary General of the Public Board for Development of Low-Emission Economy

Prof. Źmijewski reminded that the greatest problem for Poland will be the gap in the energy balance after 2016, and he stressed the need to answer the question “how to close this gap”. He warned that the crisis would not cause a decrease in peak power consumption. The industry moves production to the first shift which is cheaper. Therefore, peak power consumption increases despite the fact that overall energy consumption drops, he noted. Another problem that Poland will have to face is the costs associated with carbon dioxide emissions, for which the allowances will have to be bought in other countries. This means another increase in costs due to the need to make investments. All these factors may lead to the loss of competitiveness by the Polish industry and, consequently, to its migration to other countries where climate-related regulations are not so strict, he concluded.

Prof. Źmijewski disagreed with the statement that Poland’s carbon dioxide emissions in 2011 and 2012, as calculated per capita, are similar to the European average. Unfortunately, they are higher, he corrected, because brown coal consumption has increased, and the increase in renewable energy sources is still insufficient. However, Poland does have some significant achievements too, he added. It has managed to reduce its emission level by 5 times more than the expected amount of 6%. Energy efficiency has increased by two times. In 2005, the system of Green Certificates was implemented. As regards the certificates, prof. Źmijewski expressed the hope that the new legislation is going to stabilize the system so that it does not collapse, as it happened in the case of Red Certificates. In 2012, the National Fund for Environmental Protection launched a support system for energy-efficient buildings and passive buildings, as well as two new systems aimed at supporting low-emission transport

and energy-efficient lighting systems in urban areas, he enumerated. If the Law on renewable energy sources is adopted, in 2013 the system of White Certificates, and a system supporting prosumer energy will be introduced, he concluded.

In the next part of his presentation, prof. Żmijewski presented the National Programme for Development of Low-emission Economy which covers several hundred areas of activity in 11 sectors of the economy. According to prof. Żmijewski, an area of particular importance is dialogue and education without which there may be no sufficient social acceptance for the implementation of the National Programme. Then prof. Żmijewski presented the objectives of National Programme for Development of Low-emission Economy: 2000 MW from energy efficiency improvement; 2000 MW from energy imports from other countries; 2000 MW from prosumer energy; the construction of fast-acting emergency sources to balance the system in the case of reduced production from renewable energy sources; cogeneration introduction at heat plants; thermal modernisation of buildings; low-emission transport; construction of zero-energy buildings, and energy-efficient lighting systems, he enumerated.

He also drew attention to the needs regarding legislation, new technologies - especially Polish ones developing the country's economy; development of installation and maintenance capacities; launching financial support mechanisms, and high-level information and education activities. Poland wants to improve its energy efficiency, increase its competitiveness, modernise the infrastructure, diversify the supplies, reduce energy consumption and, which is of particular importance according to prof. Żmijewski, to reduce its overall emissions.

At the end of his presentation prof. Żmijewski mentioned the issues related to the European Union policy. In his opinion, Europe has to change its direction because the migration of industry and the related "leakage" of emissions are becoming a real threat to it. He expressed the regret that despite many regulations and efforts, the global emissions continue to grow. Poland is able to offer many solutions to the European Union but there is no sufficient possibility for dialogue, he added. There are possibilities for Polish-European cooperation in the field of reform of the European energy sector. Poland is open and willing to cooperate, he concluded.

PANEL DISCUSSION

Development directions of the European energy market and their consequences for the Polish economy (fossil fuels, gas, electricity, heat, RES) - technologies, investments and market trends for the industry and end users (liberalisation of prices), and the experience of other countries.

In the next decade, will the power sector's direction continue or will there be any breakthrough?

Marek Woszczyk, President of the Energy Regulatory Office

According to President Woszczyk, a breakthrough in the power sector has already started. He noted that still 10 years ago in Europe, green energy was used on marginal scale. Today, the situation in this area is much better. However, green energy development was not a spontaneous process but was, in some way, forced by new European Union regulations, he added. The question arises whether the development's dynamics will be maintained. According to President Woszczyk, in the next 15-25 years we will most likely be witnessing a continuation of the gradual transition from the conventional energy towards smart energy, rather than a spectacular breakthrough. President Woszczyk expressed the hope that the new model of energy infrastructure will enable active participation in the market by small producers of electricity, called prosumers, who want to produce electricity for their own use and also to participate in the market. A potential breakthrough to a large extent depends on innovations, and these in turn depend on the market, he said. The more competition there is in the energy market, the greater the impetus towards innovation. In Europe, the chance for the development of free competition lies in the development of a single energy market, he concluded.

Daniel Borsucki, Katowicki Holding Węglowy SA

Daniel Borsucki, in contrast to the previous speaker, was of the opinion that a breakthrough in the energy sector should be expected, not only in terms of new technologies, but also in coal energy. Although by 2025 the share of the latter will slightly decline, it will still remain the basis for the Polish power sector, he assured. Coal is an excellent fuel but it has to be used more effectively, he added. Currently, thanks to the construction of new units and the modernisation of the old ones, efficiency can be improved by 8%, which means as much as 200 kg less carbon dioxide emissions per one MWh of electricity produced. He also drew attention to the fact that the power industry today requires better-quality coal. However, as a result of the manufacturing process lower quality coal is also produced. It is a good fuel too and thus coal companies will use it to produce electricity with efficiency on the level of 40-50%. This will allow, inter alia, to avoid the cost of transportation, he added.

Daniel Borsucki also presented the directions of innovations developed by KHW SA. One of them is investments in methane which is obtained during coal extraction. Katowice Coal Holding also wants to capture methane ahead of mining, which will improve safety and

economics of the company. The captured methane is a very good fuel which can be processed into electricity and heat, he assured. KHW SA also focuses on new coal processing technologies such as underground coal gasification within the deposit, he added. Research projects in this field are carried out, he concluded. According to Daniel Borsucki, in the Polish energy mix until 2025 there will be no place for large-scale nuclear power, if only for social reasons. Coal will remain the basis of the Polish energy sector and will continue to provide energy security of the country.

Janusz Bil, acting President of the Board, ENEA

President Bil opened his presentation by stating that the fastest technological growth is observed in the military sector. In his opinion, in the energy sector over the next 10 years not much is going to change. If any technological breakthrough takes place at all, it will be on the side of demand, not on the side of production. Energy efficiency i.e. demand-side management is a potential that is still underestimated but can bring most benefits, he emphasised.

Maciej Wolański, Managing Director, Societe Genarale

Director Wolański pointed out that energy-related investments are long-term investments and therefore they are connected with a certain degree of risk. Every project related to production is planned for a period of 15-18 years, and in such a long period a lot may happen, both on the market and in the field of new technologies, he added. Thus, banks have to make sure that the investment will repay itself, particularly that the loan component is usually much larger than own contribution of the production company involved. Therefore, according to Director Wolański, of greatest importance is a stable and regulated environment in which the project implementation takes place. He reminded that the current Polish system in 70% consists of capacities older than 30 years which entails the need to invest extra money. He noted that coal has its renaissance in the market now. There already exist supercritical technologies allowing to decrease carbon dioxide emissions as well as carry out more efficient energy production. Large-scale projects in this field are already prepared and implemented on the Polish market, and this sector is expected to grow, he concluded.

Director Wolański also pointed out the need for investing in renewable energy sources. Unfortunately, at present this energy is still more expensive and requires adequate support, he added. If the support system is stable, an increased interest on the side of investors will be observed, he assured and expressed his hope that these issues will be settled soon and there will be more investments in renewable energy sources in Poland. In concluding his

speech, Director Wolański drew attention to the fact that in Poland we are now having an economic slowdown which is why more attention should be paid to the cost-effectiveness of energy. It is necessary to answer the question to what extent renewable energy is supported and how extensively other, more proven sources are developed, such as nuclear or coal sources, he concluded.

Prof. Konrad Świrski, President of the Board, Transition Technologies

According to prof. Świrski, the European energy market in its current form has disorganised entire strategic planning in the energy sector. He reminded that the investment process in the energy sector takes at least 10 years while the energy trading market is a short-term market. Currently, all companies are focused on competing and reducing prices in the wholesale market, without taking into account the investment costs, he regretted. Prices will keep falling as long as the preferred and subsidized RES energy production is supported, and the surplus of production over demand is not lost, he said. He warned, however, that when this loss takes place, the prices will suddenly increase. Only then will banks consider the lending of money for investments into energy, but this will affect the consumers who will have to pay a lot more for it. Prof. Świrski warned that we have a difficult decade ahead of us, which will show how difficult it is to achieve the previously adopted objectives. He also expressed his disbelief in the fact that prosumer energy sector will be able to produce several thousand MW by 2016. In his opinion, this new energy will simply not be produced. The balancing will depend on the state of the economy (demand) and the speed at which the old units are decommissioned. Only the lack of electricity and its high prices may mobilise the energy sector to implement investments, he concluded.

Jacek Piekacz, Director for Regulations and External Relations, EDF Polska

According to Director Jacek Piekacz, in the coming period the power sector will continue to remain in nearly the same shape as today. The reason is the implementation of the National Investment Plan which has left no space for new power plants. This has been due to the fact that new plants may not be financed with free-of-charge emission allowances. Consequently, there will be money available only for modernisation projects, he stressed. In his opinion, the development will take place in the gas sector, mainly in cogeneration. The development pace will depend, however, on the Polish shale gas resources and the provision of long-term support for cogeneration. This requires amendment of the energy law, he added. The development of renewable energy will also be largely dependent on the shape of RES Law. The directions supported by the Law will be preferred, he stressed. Director Piekacz is

convinced that in 10-12 years the energy sector will become a little different but there will be no breakthrough because the sector will continue to rely on the sources used today.

Stanisław Tokarski, President of the Board, Tauron Wytwarzanie

According to President Tokarski, the Polish energy sector will change but the expected breakthrough connected with new technologies is unlikely to take place. He denied the statement that power companies do not build new capacities. The companies do invest but try to diversify the risks because it is still not known what the future energy policy will be like. Tauron's investments are made in the following proportion: one third in coal, one third in gas, and one third in renewable energy sources. This year three biomass-fuelled heat and power plants will be commissioned with a total capacity of 120 MW. Next year a coal-fired heat and power plant with a capacity of 50 MW in Bielsko-Biala will be commissioned. The construction of a large gas-fuelled heat and power plant in Stalowa Wola, with a capacity of 450 MW, has been started. We also plan to build a large coal-fired unit, he enumerated. He drew attention to the fact that by 2016-2017 Tauron has to decommission 1500 MW.

President Tokarski also referred to the issue of the support system for small prosumer generation in Poland. Firstly, small-scale power generation units at households will require energy storage facilities. Secondly, it should be obligatory for the producer to use the generated power for his own use. It is necessary to rationally build the framework for prosumer energy in order to prevent abuse, he insisted. President Tokarski concluded his presentation with the statement that a breakthrough in the field of smart energy consumption is now approaching indeed. However, as regards any significant breakthrough in the field of new-type generation, several decades are still needed.

Maher Chebbo, Vice-President of the Board, SAP ENEA

According to Mr Maher Chebbo, the shape of the energy sector will remain similar to the current one, and only some optimisation will take place. Initiatives regarding smart grids constitute a kind of such optimisation. In our times, energy efficiency should not just be in fashion; it has to be taken into account at the design stage of every device, he said. All household equipment items should be smart devices. He reminded that attention should also be paid to cities which are responsible for a major part of energy consumption. The key sectors in this regard are transport, power, and IT, he enumerated. He also drew attention to customers. If they are more aware, they will at the same time be more demanding when it comes to product standards. To this end, customers need information and should have access to it, he added. In Europe, 3 billion euro has been allocated to programmes related to

smart grids. They will cover smart metering and smart energy storage. Thanks to energy efficiency and smart grids households will be able to achieve energy savings on the level of 9%, he assured. At the end of his speech, he said that the transformation of the energy sector is also an opportunity to create new jobs, and that export of technologies may bring measurable financial benefits to countries.

In this context, what is the country's selection margin?

Prof. Krzysztof Źmijewski, Secretary General of the Public Board for Development of Low-Emission Economy

Professor Źmijewski defined “breakthrough” as the emergence of a completely different quality. Dispersed energy units are not going to eliminate baseload energy units, but are complementary to them, he stressed. Prosumer energy programmes have already been launched in western Europe, although for a long time they will not bring a fundamental change, he admitted. However, what is of great importance, they will change the approach to energy consumers. They will have the choice of whether to buy power from the grid or to produce it by themselves. Prof. Źmijewski argued that if the prosumers were not required to establish sole trader companies, the investments in prosumer energy would repay after about 7 years. If, however, a support system were introduced, the payback period could be shortened even to 3.5 years. Prof. Źmijewski admitted that although the lack of storage possibilities halts further development, there already exist electric cars which will be able to input power to the network, thus serving as energy storage facilities, he completed.

Questions by the Conference participants and Internet users:

How would Mr Marek Woszczyk comment the fact that nuclear power is being abandoned by Germany and Japan while Poland insists on building a nuclear power plant?

Marek Woszczyk, President of the Energy Regulatory Office

President Woszczyk admitted that it's difficult for him to comment on this fact since decisions regarding energy policy of Poland are not within the competence of the Energy Regulatory Office of which he is the president. Decisions regarding nuclear power are in fact largely political ones, he added. The office is only interested in those decision's pricing consequences for the market. He noted that in his earlier presentation he just mentioned nuclear power as an example of new technology that has appeared, and pointed to the financial risk in investing in large-scale nuclear plants which almost always require state guarantees. He reminded that any government intervention connected with the shape of the country's energy policy, or any support to the energy system, always have their impact on

the market. A diversified structure of the energy sector means lower risk, and lower risk means better prices for consumers, he concluded.

SESSION THREE – Low-emission economy

Keynote speech: The policy regarding low-emission investments in Poland (the National Investment Plan - derogation), Marcin Korolec, Minister of Environment of Poland

Minister Marcin Korolec admitted that the evolution of the Polish economy towards low-emission one, as well as the maintenance of low prices of energy, constitute a big challenge for the country. Modernisation of the energy sector, accompanied by increased energy efficiency of the Polish economy, investments in R & D and development of low-emission sources that would be most cost-effective, locally produced and integrated with the system, are the elements necessary for maintaining international competitiveness of the Polish industry, he noted. He assured, however, that over the last 20 years Poland has made a big progress in the field of improving energy efficiency and reducing emissions levels by 30%, at the same time reaching a GDP growth of 150%.

Minister Korolec indicated the main objectives i.e. economic growth, improved living standards and joining the group of most developed economies of the world. At present, Poland has a very low level of wealth, he reminded. Therefore, the country is facing a very difficult task of selecting energy and economic policy tools which would be most appropriate for Poland's situation. He quoted data from a World Bank report, according to which the costs of emission reduction in Poland will be higher than in other EU countries. However, the effort is inevitable, he concluded.

The Polish Investment Programme for the energy sector will allow to rapidly increase the efficiency of energy production, he ensured. Polish energy producers will receive partly free emission allocations provided that they implement investments into new technologies. The scale of the programme exceeds 200 billion PLN, he added. The Minister pointed out that energy efficiency is the most cost-effective direction of the climate policy. Reduction of energy losses and energy demand are the main methods of reducing the emissions of the Polish economy. The system of White Certificates will support activities in this area, he emphasised.

In his presentation, Mr Minister commented on the shale gas extraction project. He reminded that from the point of view of energy security and the need to balance the current demand for energy Poland can not afford to fully replace coal with gas. Yet, the use of the country's own shale gas resources could lead to rapid reduction of emissions in a similar way as in the

United States. For the reduction of emissions, it will be of key importance to introduce appropriate legal regulations i.e. the so-called energy tri-pack of legislation, and to participate in the European Commission initiatives regarding the creation of an integrated European energy market.

Minister Korolec assured that one of the most important elements of Polish industrial policy is the programme of development of renewable energy sources whose growth dynamics is 100% per year. Of key significance is the need to develop a support system which would not burden the customers with the costs of the subsidies, would be technologically neutral and support employment and production within the Polish economy. The stable system of support to new technologies should provide for gradual phasing out of subsidies for technologies reaching maturity in the market, and protect against mistakes made in the systems in other countries, he concluded.

Minister Korolec recalled that the European climate policy is not only a means of protection against the effects of climate change, but also an economic programme aimed at the development of new technologies and the achievement of competitive advantage. He assured that the Polish government will support business in this area. He enumerated, inter alia, support projects of the National Centre for Research and Development concerning shale gas technologies, environmental technologies, GEKON programme and Green Evo programme.

According to the Minister of Environment, the evolution towards low-emission economy should be perceived not only as a threat but also as an economic opportunity for the Polish market. Well-designed energy policy will not only help to meet environmental objectives but will also support the economic development of the country, he concluded.

PANEL DISCUSSION

Low-emission economy in Poland - the implementation costs (financing), potential investments, technologies, legal and economic barriers and experience of other countries

Małgorzata Skucha, Vice-President of the National Fund for Environmental Protection and Water Management

Vice President Małgorzata Skucha assured that the National Fund plans to make available to investors funds for energy efficiency, renewable energy sources and smart grid development. She noted that the programme relating to RES is enjoying high popularity and therefore the funds for subsidising solar panels have been increased from 300 to 450 million PLN. As a part of its new strategy until 2016, the Fund is going to allocate 4.6 billion PLN for climate protection, she added. "KAWKA" programme which aims to eliminate the low emission will

soon be adopted, and the CAFE (Clean Air For Europe) Directive will be implemented. There are other novelties too, she emphasised, such as GAZELA programme to support clean urban transport and SOWA programme relating to energy-efficient urban lighting systems. Works is also ongoing on LEMUR programme which will finance the construction of energy-efficient public buildings and a programme of subsidies to energy-efficient buildings, she enumerated.

Ms Vice President also announced that on the sale of emission allowances Poland has already earned 780 million PLN for which the National Fund For Environmental Protection and Water Management is the national operator. Within this amount, several programmes have been developed concerning mainly public buildings, but also biogas plants and networks. In addition to the investment projects, the National Fund also wants to focus on education on reducing energy consumption and improving energy efficiency, ensured Vice-President Skucha. There is great potential in this area and we will encourage all those interested, she concluded.

Mariusz Klimczak, President, Bank Ochrony Środowiska

President Klimczak noted that the energy sector is facing a major investment challenge requiring many years and hundreds of billions Polish zlotys. This, obviously, involves risk, he added. The investments projects are very large, expensive and often implemented in new areas such as distributed power generation. In addition, President Klimczak raised the issue of thermal modernization and improvement of energy efficiency. This issue concerns many heat and power plants as well as heat plants which have to reduce their emissions beyond 2016, he reminded. The upgrading of those plants will require large investment outlays. He assured that Polish banks do have funds for such investments and want to support such projects as long as they are economically feasible. However, for banks to be able to finance the projects, appropriate medium and long-term conditions have to be ensured, he added. This is a big challenge for the regulator, he concluded.

Krzysztof Pietraszkiewicz, President of the Association of Polish Banks

President Pietraszkiewicz noted that the outline of the programme presented by the Minister of Environment included references to very large projects that carry a high risk. In the present times, it is difficult to develop long-term forecasts, he stated, but the development of insurance and reinsurance strategies or such projects requires stability. According to President Pietraszkiewicz, in order to enable the implementation of such projects the country needs to conduct a stable and predictable economic policy. There is also a need for technically well-prepared programmes, he added. The second important issue, according to

President Pietraszkiewicz, is the funding sources. He informed that in Poland the increase in deposits is around 8-12% each year. Out of this, more than 325 billion PLN is related to the financing of 25-30 year housing projects. These assets must be somehow "freed" to find funding for the economy, he stressed. The banking sector is waiting for the appropriate regulations in this regard. According to President Pietraszkiewicz, it is necessary to increase the share of long-term liabilities in the system; this will allow to finance long-term investments. Today, the economy can be credited up to three per cent with the use of such liabilities. It's a drop in the ocean, he regretted. He suggested that the solution to this problem may lie in the introduction of an appropriate program mobilizing the citizens to keep long-term savings deposits. In concluding his speech, the President of the Association of Polish Banks drew attention to the issue of appropriate knowledge and education. Experience shows that in many projects the critical element is reliable expertise and advice. He also noted that in other countries, each loan granted for modernization is always preceded by an analysis of energy consumption. Mr President suggested that this system should be introduced also in Poland to promote those projects that take into account energy efficiency.

Sylwester Śmigiel, Chairman of the Efficient Energy Development Forum; President of the Board, Gaspol

President Śmigiel in his presentation focused on the issue of micro-cogeneration. He admitted that appropriate solutions for the development of prosumer energy are still lacking but he expressed the hope that the situation will change soon. In his view, there is a huge area for micro-cogeneration development. Appropriate technologies are already available, he added. These include micro-sources with capacities from several KW to several dozen KW, which, due to the ability to work without interruptions, are very stable. He noted, however, that these technologies are still relatively expensive and for micro-cogeneration to develop, support is needed similar to that in the field of renewable energy. President Śmigiel sees huge potential in micro-cogeneration which can be used by households and small businesses. Unfortunately, bureaucratic obstacles are huge, he regretted. The use of micro-sources is subject to the same legal regulations as those governing nuclear power production. In such conditions, prosumer energy has no chance to develop, he concluded.

Jerzy Kalinowski, EDP Renewables Polska

Jerzy Kalinowski in his presentation focused on answering two questions regarding renewable energy sources, which questions in his opinion are of key importance. Can Poland

afford to develop low-emission energy coming mainly from renewable sources? Will renewable energy be competitive within a 10-year period? Mr Kalinowski quoted data for 2010 on new capacities installed in Europe. The first place was taken by gas-based generation: 26000 MW, followed by photovoltaics in the second place: 12 000 MW, and wind power: 9 000 MW in the third place. In addition, 4000 MW coal-based capacity was installed while more than 1000 MW was decommissioned, he enumerated. Other technologies have been used to a minimal scale. According to Mr Jerzy Kalinowski, this should be an indication for Poland as to what change directions to adopt for the Polish energy sector.

Then President Kalinowski spoke about the costs of power production. In 2012, there was a decrease in wholesale energy prices by 40 PLN per MWh. The reason for this decline to a minimum extent was a decrease in consumption, and an increase in power generation from renewable energy sources, in particular wind, he stressed. The obligation to buy energy from renewable sources first, resulted in a decrease of the conventional energy market. The average price of electricity for 2012 was lower than for 2011, he added. President Kalinowski concluded his presentation by stating that Poland should not be afraid of renewable energy because in a few years, thanks to the development of new technologies, it will be fully competitive with conventional energy.

Andrzej Szymański, President of the Board, Landis+Gyr

President Szymański mentioned a rarely mentioned topic of investments in the energy sector. In his view, the year 2012 did not bring the expected changes and little was happening in the energy market. He regretted the fact that distributors who each year replace between 100 000 and 300 000 electricity meters still use old technologies. Suppliers of equipment need time to produce it, and so far, except of Energa Distribution, no company has concluded contracts for the implementation of smart meters. What's more, none of the companies has commenced the tender procedure which also takes time. According to President Szymański, Poland still lacks experience, procedures, and policies required for the implementation of major smart grid projects. The solution should not be sought in pilot projects regarding smart grids, because, in his view, any system will be working at the micro-scale. However, real problems will arise when the scale is increased to hundreds of thousands, he warned. If, in the area of smart grids, Poland wants to expect the effect of scale in a short term, the existing technologies should be put into use already today, even if they are not fully comply with certain Polish requirements, he concluded.

Marcin Wróblewski, Warsaw Municipal Office

Marcin Wróblewski agreed with the statement of the Minister of Environment that any plan of action towards improved energy efficiency has to be adjusted to local conditions, and assured that Warsaw does have such a plan. The country's capital city has been paying attention to the issue of integrated energy and climate policy for several years already.

In 2009, Warsaw signed the Covenant of Mayors on reducing greenhouse gas emissions by at least 20% by 2020. After two years, the Action Plan for Sustainable Energy Consumption, connected with the Covenant, was signed. It envisages a 20% reduction of energy consumption and emissions, and an increase in the share of renewables in the market up to 20%, he enumerated. The overall implementation costs of the plan are at the level of 16 billion PLN, he added. Therefore, it is important to have different financing possibilities for those investments, he concluded.

Then, Mr Wróblewski presented the municipality's measures used for the implementation of the provisions of the above mentioned plan. They focus on public transport, energy-efficient street lighting, and reducing energy consumption in municipal buildings. In the public transport, the use of alternative fuels and drives is envisaged. Preferences have been introduced for hybrid and electric cars. The city is most interested in the possibility of electrically fuelled vehicles with the possibility of electricity input to the grid, and in gas-powered buses, and will cooperate in this regard with the National Fund for Environmental Protection. In addition, thermal modernisation of public buildings is planned, and pilot activities are carried out concerning low-energy buildings, he enumerated. Marcin Wróblewski also mentioned the ambitious target for the future, which is to create in Warsaw a low-emission area where model solutions will be used with regard to spatial planning, buildings, transport, solid waste management and water and wastewater management.

He noted, however, that the implementation of all the plans required significant financial resources. Therefore, the municipality is awaiting the EU's new financial perspective envisaging funds dedicated to energy efficiency, as well as financial instruments targeted at cities, he concluded.

Questions by the Conference participants and Internet users:

There exist calculations which indicate that the implementation of the Road Map until 2050 will cost hundreds of billions euro, and will be detrimental to the Polish economy. Is this true?

Prof. Krzysztof Źmijewski, Secretary General of the Public Board for Development of Low-Emission Economy

Prof. Żmijewski admitted that the Low-emission Economy Programme will cost several hundred billion euros by 2030. However, he asked whether Poland can afford not to build power plants and not to modernize the network. According to Professor Żmijewski, the answer is obvious. The investments are a necessity. Instead of new technologies, traditional technologies could be used, which would probably be cheaper by about 20%, but their operation would be 50% more expensive, he concluded. He assured that the new technologies are already available. The Law on renewable energy sources has been prepared, and there exist financial instruments too, he enumerated. According to prof. Żmijewski, the biggest problem is the lack of sufficient creditworthiness of commercial power plants. Therefore, prof. Żmijewski is of the opinion that support should be provided to distributed energy. This will make it possible to attract other sources of capital. Prosumer energy is profitable although it is known that it is only a vision of the future, and many questions related with it still have to be answered, he concluded.

Why is there no funding for photovoltaic panels but only for solar collectors?

Małgorzata Skucha, Vice-President of the National Fund for Environmental Protection and Water Management

Vice-President Skucha acknowledged that last year, this was simply still unprofitable. However, she ensured that after the prices of photovoltaic cells have dropped, the National Fund is starting to consider the provision of support to this type of solutions. The Fund is waiting for the adoption of the new Law on renewable energy sources, as the instrument proposed by the National Fund has to be adjusted to the support system envisaged in the Law, she added. Certainly photovoltaics will be supported, particularly in the prosumer energy sector, although its support will be granted in the form of loans rather than grants, she concluded.