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The VI International Conference NEUF 2010 – New Energy User Friendly took place on 18 June 2010. This year's edition was given the title of „Public consultations in respect of the road maps of the National Programme for Reduction of Emissions.“

The topic of the conference regarded issues of fundamental importance to the Polish economy, namely the need for a compromise between the guidelines set out in the Energy and Climate Package and economic growth, which is to be reflected in the execution of the National Programme for Reduction of Emissions. The experts invited to participate in the event, who represented three functional approaches to the issue of sustainable development in an economic context – an institutional approach, scientific approach and business approach – presented existing means of development in respect of reduction of greenhouse gas emissions, increasing the participation of RES in the final energy balance, increasing efficiency, application of clean coal technologies and restitution of sources, which could be carried out whilst simultaneously ensuring secure development of the Polish economy.

The organisers of the conference were: Procesy Inwestycyjne Sp. z o.o., the ETA Association for Efficiency, the E. Kwiatkowski Institute.

Honorary patronage of the event was granted by: the Ministry of the Economy; the Ministry of the Environment, Representative Office of the European Commission in Poland and the Consultancy Board of the National Programme for Reduction of Emissions.

Media patronage of the VI edition of the NEUF conference was granted by: Rzeczpospolita, Czysta Energia, Ecomanager, Energia i Budynek, Nowa Energia.

The VI International Conference NEUF 2010 – New Energy User Friendly „Public consultations in respect of the road maps of the National Programme for Reduction of Emissions“ was organised with the aid of additional funds from the National Fund for Environmental Protection and Water Management.

Opening the conference, **Mrs. Marina Coey, President of the Management Board, Procesy Inwestycyjne Sp. z o.o.**, greeted the speakers and thanked the strategic partners, partners, media partners and participants of the event for attending.

The conference was then formally opened by Mr. Waldemar Pawlak, Deputy Prime Minister, Minister of the Economy, as well as Ms. Hanna Gronkiewicz – Waltz, Mayor of Warsaw.

Mr. Waldemar Pawlak was the first to speak, highlighting that the issues of climate protection, energy efficiency and energy security are incredibly important for Poland. He thanked the participants of the conference, and above all Commissioner Connie Hedegaard for coming to Poland. Climate protection and energy will be the deciding factors setting out the conditions for social development in the XXI century. It will not be easy for Poland to face the challenges that are connected with this, as the national energy sector is based mainly on coal. Mr. Pawlak simultaneously stressed that as a member state we want to move to the green side of power, i.a. through promotion of clean coal technologies, an example of which is a project relating to coal fuel cells. Execution of such projects will allow for more efficient use of coal.

At present, the priority is to take a comprehensive look at energy. Instead of concentrating on improving the efficiency of a specific fuel, we should seek possibilities for raising the efficiency of the entire system. Poland has made additional efforts in order to direct current policy in the direction of modern, high-efficiency technologies. With this aim, a map of the potential for reduction of emissions during the period up to 2030 has been created, in cooperation with McKinsey & Company. This has allowed for diagnosis of the areas in which we can reduce emissions in an economically efficient way. These means include efficient waste management and use of biomass.

A report has also been prepared in cooperation with the International Energy Agency, which shows how Poland can reduce emissions and improve the efficiency of fuel use. Research shows that we can become a leader in respect of development of clean coal technologies.

The changes that have come about in Poland over the past few years show that it is possible to be a country that reduces emissions and simultaneously maintains economic growth (from 1988 we have reduced emissions by 30%, whilst GDP has risen by approx. 70%). Inclination of specific sectors to reduce emissions, create new technologies and solutions changing the profile of the economy to a more green one is a challenge. Mr. Pawlak noted that solutions such as properly carried out benchmarking and use of BAT are in practice more efficient than full auctioning or emission fees. We must make use of our potential and move over to the green side of power in the most efficient way (both from an environmental and social viewpoint).

Ms. Hanna Gronkiewicz – Waltz turned attention to the fact that the New Energy User Friendly conference is taking place specifically in Warsaw as this city is a leader in CEE in respect of activities aimed at environmental protection. In line with the *Covenant of Mayors*, the municipal authorities aim to agree a plan for sustainable use of energy, with the aim of reducing emissions by over 20% by 2020. Warsaw also has a chance at becoming a leader in respect of sustainable energy management, ecological transport and development of dispersed generation in urban areas on a national scale. More and more energy is generated in the process of cogeneration, which allows coal use to be reduced by 30%. Plans also encompass increasing the amount of green energy obtained from biomass (this is to ultimately be 15% by 2020). A project for an intelligent heating system is being actively developed. This will allow for power losses to be reduced, thereby reducing emissions. The Constant Communal Waste Management Plant (ZUSOK) is to be extended by 2015, which – once modernised - will utilise approx. 38% of communal waste, which will allow for power restitution and delivery of heat to the network. This will then allow for 11 thousand homes to be heated and the costs of waste utilisation to be reduced.

An urban team for climate protection has been created, which is responsible for monitoring activities in respect of rational use of energy during the period up to 2020. The scope of competencies of this team includes decision-making in respect of reduction of CO₂ emissions and lowering energy use. The city also organises educational and promotional campaigns in respect of lowering energy use.

In respect of energy security, plans include conclusion of an agreement¹ on cooperation in respect of ensuring the security of electricity supply to towns and creation of a task force for development of energy.

SESSION I

REDUCTION OF EMISSIONS – GENERAL CONTEXT

Session I was chaired by Professor Michał Kleiber, Deputy Chairman of the Public Board of the National Programme for Reduction of Emissions (PBNPRE) and the President of the Polish Academy of Sciences

The first speaker was **Ms. Connie Hedegaard, EU Climate Action Commissioner**, who began her presentation by thanking the organisers of the conference for inviting her and expressing the Commission's deep sadness over the tragedy in Smoleńsk.

¹ The parties to this agreement are to include: the Office of the Municipality of Warsaw, Vattenfall Heat Poland SA, PSE – Operator SA and RWE Stoen Operator Sp. z o.o.

Commissioner Hedegaard highlighted that, in the context of overcoming the economic crisis, a key task is implementation of solutions relating to energy efficiency. We should not view these as a burden, but rather as a future benefit. Many EU citizens may believe that climate change does not regard them. However, such individuals do not take into account that the temperatures recorded in March, April and May 2010 were at an all-time high. Climate experts foresee that the temperature will rise by as much as 6°C by the end of the XXI century. In this context, it is vital that an international consensus be reached in respect of climate issues, which would continue the work started under the Kyoto Protocol.

During the COP congress in Copenhagen, many entities were still not ready to compromise, but the Commission is hopeful that during the next summit in Mexico many of the most pressing issues will be resolved. It is already clear that there is an increase in awareness in countries such as the US, China, India, Brazil and South Africa. However, Europe should not wait for the rest of the world. It should undertake action today, as improvement of energy efficiency and independence from carbon is in our interests. Execution of these aims will ultimately lead to increased competition and energy security. This is a major challenge, but also opens up great potential. Poland also has great potential, and can – in the context of execution of the provisions of the Energy and Climate Package – rely on European funds from operational funds for the period from 2007 – 2013.

The actions undertaken by the EU have showed the rest of the world the enormous potential that is to be found in high-efficiency technologies, which include RES, energy efficiency, CCS and smart grids. Europe is currently a global leader in this respect, although more and more countries are catching up (in the case of development of RES – China and Taiwan produce the greatest number of solar panels in the world). With this in mind, it is vital that further actions are undertaken so as to not be left behind by other market players. Development of green investments in Europe is also very important in the context of limiting unemployment. It is precisely projects aimed at obtaining power from renewable sources (wind, biomass) that show that the Polish economy can become independent of coal. In turn, improvement of energy efficiency can allow for reduction of importation of fuels, as well as improvement of energy security and political independence.

The European Union has also established obligations in respect of increasing the reduction aim to 30% if other countries join the climate treaty. Although at this point the conditions of the global agreement have not been fulfilled, Europe must be ready to execute it. For this reason, the Commission is currently analysing the possibilities for achieving this goal by 2020. If it were to prove necessary, the concept of increasing the aforementioned goal would be discussed with representatives of all member states.

It is an undeniable fact that Europe needs innovative solutions. We must remember that the increased effort being made today will yield a return tomorrow, in the form of increased competition, more jobs, lower energy bills, decreased pollution, and also improved energy security.

Concluding her presentation, Commissioner Hedegaard highlighted that it is vital that actions combating climate change be undertaken at both a European level and within each member state. The fact that Poland is creating its own strategy in respect of combating climate change is a very good sign. Whilst adaptation activities, as well as attempts to achieve a low-carbon economy, can be viewed as an additional burden, we cannot fail to execute them. The policy of sustainable development lies in the common interest of all of the European Union.

After Commissioner Hedegaard's presentation, the participants of the conference were able to turn to the speaker with questions and comments.

Mr. Ryszard Śnieżyk noted that political decisions that are often based on unverified theories often impact upon society, which bears the costs to the greatest degree. In addition, he asked about the number of meteorological stations proving that the temperatures in March and April were the highest ever noted.

Mr. Tomasz Bańka highlighted the necessity of involving society and young people in a tree-planting campaign.

Mr. Wojciech Lubiewa – Wieleżyński turned attention to the issue of intermediate emissions encumbering i.a. the Polish industry sector, which has thus far not been solved by the European Commission and which could lead to enormous losses.

Commissioner Hedegaard began by answering the last question. She highlighted that this is a highly technical problem, and one that is not easy to solve, and simultaneously assured the participants of the conference that the Commission will do everything to find a solution that is acceptable to all sectors.

Ms. Hedegaard also supported the concept of planting trees, which has developed across Europe. Commenting on Mr. Śnieżyk's views, she stated that even if climatologists are incorrect, activities aimed at increasing energy efficiency and lowering the emission of pollutants are still valuable and proper actions.

The next presentation was made by **Mr. Marcin Korolec, Undersecretary of State in the Ministry of the Economy**, who started his speech by highlighting that approx. 90% of energy production and approx. 77% of heat production in Poland is based on coal. This is why the situation Poland is in, as compared other EU member states, is special; in

particular, Poland's economy is highly sensitive to all regulations regarding limitation of emissivity. In spite of this, we have decided to actively fight climate change and accept the obligations imposed by the Energy and Climate Package. Analyses carried out by the consultancy company McKinsey, as commissioned by the Ministry of the Economy, show that we have only 3% reduction potential for the period up to 2020. The cost of these obligations is huge. On the other hand, Poland has exceeded the scope of the obligations set out in Kyoto five times over (6%/30%), carrying out this plan without slowing dynamic economic growth. Emission of GHGs in other EU member states over the past year has significantly exceeded the levels set out in the Kyoto protocol and it is precisely thanks to the new EU member states, such as Poland, that the EU can say that as a whole its obligations have been carried out. Adoption of reduction obligations by the rest of the world is a key factor in execution of further actions. If reduction aims are only implemented by Europe, on a global scale this can lead to *carbon leakage*. *We must seek solutions that would simultaneously be pro-environment and would not act against the competitiveness of specific sectors*. Reduction actions should be aimed at ensuring energy security and generating jobs. The assumptions of climate policy should be verified and made independent of public subventions. It is incredibly important for local conditions to be taken into account in the planned directives.

Mr. Korolec then presented the backdrop and tasks of the Polish Energy Policy for the period up to 2030. The Polish energy sector faces enormous challenges – high demand for energy, out-of-date infrastructure, dependence on external supplies of oil and gas, as well as obligations in respect of climate protection, means that decisive action is vital. The main directions for development allowing for the aforementioned challenges to be fulfilled are: improvement of energy efficiency (priority), increased security of supply, diversification of the generation structure, development of RES, improvement of competition, limitation of the effect of the energy sector on the environment, and also decreased energy-intensity and maintenance of zero-emissions economic growth. In order to make the actions it undertakes more efficient, the Ministry of the Economy is aiming to implement the Energy Efficiency Act and a White Certificates system, increase generation capacities and networks, as well as regulate issues relating to nuclear and renewable energy.

After this, the assumptions of the National Programme for Reduction of Greenhouse Gas Emissions were presented. Execution of this plan results from the necessity of identifying reduction activities in all areas of the economy, in a cost-effective manner. The programme is to ensure benefits such as: increasing the security of supply, increasing innovation and competition, implementation of new technologies, decreasing energy-intensity and creation of new jobs. The assumptions of the plan were accepted by the Ministry of the Economy on 16 June 2010, and will now be presented to the Council of

Ministers for acceptance. The programme assumes economic development without the need for abandonment of the use of coal. It will encompass a list of actions, which will be matched with reduction values and cost estimates.

Prof. Andrzej Kraszewski, Minister of the Environment, presented the assumptions of Poland's climate strategy. HE highlighted that climate change is an indisputable fact, but that we must remember that combating it is not a burden, but rather leads also to many positive effects such as: energy efficiency, technological development and sustainable development. Climate change forces us to get to grips with dilemmas connected with ensuring political, energy-related and social security.

According to Minister Kraszewski, the fundamental pillars of Poland's climate policy (bearing in mind that Poland is an EU member state) should be: protection of the Polish and EU economy and resolution of challenges connected with climate change (e.g. identification of means of dealing with floods, which are now happening on a regular basis). Prof. Kraszewski stated that the British have an appropriate approach to the issue of climate change, and do not contemplate whether or not to act, focusing instead on not deepening the level of problems that future generations will have to face.

In this context, Poland should find answers to questions relating to issues such as how to ensure the competitiveness of its own economy in the context of carbon leakage; how to achieve the 2020/2050 reduction aims as a leader of change, and how to convince society that these actions are necessary and beneficial.

In order to stop the growth of the global temperature, we must elaborate effective schemes for adaptation to climate change. When executing such policies, we must also not forget about specific local conditions, so as to avoid potential destruction. This is particularly relevant in the context of Poland, the economy of which is based on high-emissions coal, and which is characterised by out-of-date infrastructure, small power excesses, low investment potential and also a poorly developed energy network that is a barrier to the development of conventional energy and RES. This means that action must be taken in the very near future. The Polish climate policy should encompass use of that which we have already achieved (from the time of signature of the Kyoto protocol we have reduced emissions by 30%, and in spite of this achieved a significant leap in economic development – GDP has increased by approx. 70%). This excess of saved-up AAU units has been predestined by Poland for aims connected with combating climate change and development of green investments.

Transferring to a zero-emissions economy requires us to develop alternative sources of energy (including RES), improve energy efficiency in all sectors and prepare a programme of adaptation to climate change. We must remember that coal will remain a

long-term guarantor of energy efficiency, which is why development of clean coal technologies must become a vital priority. The next challenge for the government is to convince public opinion and society in general of the beneficial nature of these actions.

Minister Kraszewski noted that Poland is a country in which consecutive stages of low-emissions development have been executed over a 20-year period. The current task is to maintain and accelerate the current tempo of development. To conclude, Prof. Kraszewski highlighted that climate protection is, next to water management, a priority for the Ministry of the Environment.

The next speaker was **Mr. Jan Bury, Secretary of State in the Ministry of the State Treasury**, who discussed the needs and priorities of investments in the context of demand for electricity. He highlighted that investments in the Polish energy sector are dependent not only on climate policy, but also on the age of infrastructure and increased demand for energy.

Referring to specific indices, Mr. Bury presented the scope of the problems that the Polish energy sector faces in the context of execution of the aims of the PEP 2030. These include: the necessity of building new generation units, reconstruction of the network, distribution equipment and transformers. Many elements of the current infrastructure are more than 30 years old. Lack of investment can hinder achievement of the aims of the Energy and Climate Package, including development of RES. Taking into account the forecasted development of wind energy, biomass and biogas units, and also – in the long term – nuclear energy, it is difficult not to notice that the need for development of new investments is huge. In order to realise this potential, it is vital that financial support is obtained from commercial financial institutions, as well as from the EU.

In order to illustrate the backlog that the Polish energy sector must make up and the costs that it must bear over the next few years, Mr. Bury presented the fuel mix of energy companies in Europe (e.g. ENEL has only a 29% participation in the coal sector, 8% in nuclear sources, and 28-30% in RES, whilst PGE has a 96% share in coal resources, approx. 3% in the gas sector, and 1% in the RES sector). A significant backdrop for investments is also privatisation of energy companies. In this context, the role of the state will remain significant, as the state will have to create conditions for investment and also encourage investment.

Mr. Jan Bury also presented specific examples of executed implementation actions. For example, PGE assumes that it will spend approx. 170 billion PLN on investments during the period up to 2030. Of this, approx. 40 billion will be spent on nuclear units and approx. 30 billion on wind units. Investments will oscillate around efficient and highly viable conventional units that are adapted to capture of CO₂. The Tauron Group also

intends to spend a large sum on investments, the largest of which will be the power plant in Jaworzno, which has been adapted to capture of CO₂. The gas installation in Stalowa Wola will be a significant investment, as will investments made by private entities (e.g. the biomass unit in the region of Połaniec that is owned by the EDF Suez group or Vattenfall's investments).

Investment success will be dependent on whether the state will be able to prepare good conditions for financial support and elaborate good conditions for financial support from EU programmes. An important task will be elaboration of maps relating to means of financing of the Polish energy sector.

The next speaker was **Mr. Pradeep Monga**, Director for Energy and Climate, PTC Department, UNIDO, who touched upon issues connected with the development of industry in light of climate change. One of the most important issues faced by industry is identification of solutions that simultaneously allow for climate protection and secure and competitive growth, without lowering the level of investments. Requirements connected with climate change can create conditions for improvement of energy efficiency in the industry sector. In order to execute the challenges faced by the economy, it is vital that attention is turned to all aspects of the problem (both issues connected with climate change and emissivity, as well as energy poverty or access to power).

A priority that is becoming more and more prominent is the development of energy efficiency, not only in the industry sector but also in construction and transport. Poland has many achievements in respect of lowering energy use and developing efficiency, but can still do more in this respect. In this context, it is important that an integrated, complex approach to the problem be adopted. A significant element allowing for limitation of emissions and lowering of energy intensity is the development of know-how (e.g. CCS), alternative energy sources and dissemination of the best available technologies. We must remember to ensure stable legislative and economic conditions. Another challenge will be the transformation of the management processes currently applied in energy companies. Even at present companies are noticing the problem and are trying to solve it, which is manifested in the increase in demand for low-emission technologies. Therefore, in order to stay on the market companies must also take into account such instruments as carbon tax or product labeling, which impact directly on competition in the industrial sector and commercial relations.

According to Mr. Pradeep Monga, the most important global aims for the period up to 2030 should be – improvement of the efficiency and cost-effectiveness of the industrial sector, development of low-emission technologies, diversification of sources, as well as ensuring full access to energy and limitation of energy intensity by 40%.

In summary, Mr. Monga once again highlighted that improvement of energy efficiency is the most feasible means of reducing greenhouse gas emissions. In the interests of achieving sustainable development, action must be taken now. This will allow any barriers to be eliminated.

The next point of the conference was a multimedia presentation made by the **Chairman of the European Parliament and the Chairman of the Consultancy Board of the National Programme for Reduction of Emissions (SRNPRE), Professor Jerzy Buzek**. In his presentation, Mr. Buzek presented the tasks of the National Programme for Reduction of Emissions, the aim of which is to work towards a achieving an environmentally friendly and competitive economy in Poland. The members of the Board support the work of the government through their own activity. Green economy and the Energy and Climate Package are EU priorities that Poland must comply with. EU requirements are superimposed upon other tasks that should be carried out by the Polish economy, which include modernisation of infrastructure and the energy sector. The SRNPRE executes 5 main road maps – clean coal technologies, energy efficiency, nuclear energy, RES, restitution of sources. It is also responsible for fulfillment of educational aims.

According to Professor Buzek, the programme has a chance of succeeding, as it is based on a precise aim and the knowledge of prominent experts, and also makes use of experiences gained in other member states.

SESSION II

RESTITUTION OF SOURCES AND ENERGY SECURITY

Session II was chaired by Prof. Michał Kleiber, Deputy Chairman of the Consultancy Board of the National Programme for Reduction of Emissions and President of the Polish Academy of Sciences

The topic of the presentation made by Mr. **Philippe Castanet, President of the Management Board, EDF Polska Sp. z o.o.**, was energy security.

Mr. Castanet started his presentation by highlighting that the conditions for development of investments have evolved significantly over the last 20 years. When EDF began its activity on the Polish market, the price of power and fuel was significantly lower than they are now. At present, the earlier costs have been supplemented with additional obligations resulting from the necessity of combating climate change and the costs of CO₂ emissions. In this perspective, taking into account the key factor that is increasing

demand, security of supply and ensuring access to energy at competitive prices become key priorities. In order to achieve this, it is vital that transparent market conditions are created. An important element of the policy, as seen by energy companies, is the legislation that is currently in place at EU level (directives) relating to climate change, security of supply and the possibility of forecasting energy generation costs. In order to maintain competition, it is vital that a clear legal framework is set up, which would allow for related activities to be carried out in a secure manner over the coming years. Other important factors include ensuring that economic factors are stable and transparent, especially where we must undertake broadly construed investment activities in respect of modernisation of infrastructure and construction of new capacities (which is particularly important in the context of the negotiated derogation). It is only when the principles in accordance with which the energy market functions become transparent that we can carry out pro-efficiency projects and lead to actual reductions in CO2 emissions.

The main priorities, in the context of increasing demand for energy and execution of reduction aims, should be diversification of energy sources, concentration on the development of renewable and nuclear energy, as well as development of projects increasing efficiency. According to Mr. Castanet, Poland has the scope to have great achievements in respect of nuclear energy. It has the opportunity to execute many projects and cooperate with other European countries to create a platform for exchanging technologies. One of the main players in this context could be EDF, which is one of the global leaders in respect of development of nuclear energy.

The next presentation was made by **Prof. Krzysztof Źmijewski, Secretary General of the Consultancy Board of the National Programme for Reduction of Emissions**, who highlighted that the Board's mission is to provide competent, independent and comprehensive strategic advice allowing for execution of the constitutional principle of sustainable development. A basic aim is to optimise the process of reducing emissions and to achieve a means of improving energy efficiency in a financially viable way.

A basic problem of the Polish energy sector is decapitalisation of the system, which results directly from the aging of infrastructure. Over the past 5 years, Pątnów II and Łagisza II have been handed over. Bełchatów II and Częstochowa are being finalised. The most current plans encompass generation units 5 and 6 of Opole power plant. However, all of this is a drop in the ocean of need. We are practically not building any transmission lines. In order to stop the process of technical decapitalisation, it is necessary for the level of investments to remain at least 625 MWe p.a. The level of decapitalisation in respect of sources is 79%. In the case of transmission networks, the level of decapitalisation is 71%, and in the case of the heating sector – 63%. Stopping

the process of decapitalisation of technical infrastructure will require an investment of approx. 16 billion €/year (of which 5 billion will go towards the energy sector). **This is a highly challenging task, which can be compared to re-electrification of the country.** It will not be possible to execute this level of investment on the basis of a loan, as the credit rating of the Polish energy sector is insufficient (9 – 12 billion €), whilst the level of investment required during the period up to 2015 is 25 billion €. It is worth adding that repayment of interest would cause a huge increase in prices. We must therefore seek other solutions.

Legislative and financial instability is slowing down the process of executing investments, as companies have no guarantee of a return on their capital. The blue certificates system could provide a solution to this situation. This mechanism functions in a very simple manner, and money obtained from the system can be predestined only for new investments. Funds from the budget (including funds raised as a result of sale of CO2 emission allowances) will return to energy users via an efficiency fund and other investment mechanisms. If we were to implement the blue certificates system in 2011, we could increase capacity by approx. 1000 MWe p.a. from 2015 – 2016. These certificates would be granted in an auction-like procedure in which the most efficient (cheapest) entities would win. This solution could be a key one in the context of restitution of powers and execution of new investments.

The vision of Europe which produce energy in a stable and zero-emission way with maintaining the current level of economic development.

presented **Mr.Tomasz Terlecki, Representative of the European Climate Foundation (ECF) for Central and Eastern Europe**, presented a vision of a Europe that produces energy in a stable and zero-emissions way whilst simultaneously maintaining economic development. A study (Map 2050) was carried out in cooperation with consulting firms, energy companies, transmission companies and production companies.

Like the other EU member states, Poland faces the problem of restitution of powers. The majority of European generation capacities will stop functioning during the period up to 2050. For this reason, the question is not whether investments should be made, but what they should relate to. EFC has prepared different scenarios allowing for resolution of this problem. These differ mainly in respect of the degree of participation of RES in the general energy mix, which varies from 40% to 60% to 80%. ECF has also showed in its report that the scenario for 100% coverage of European demand for energy by means of energy from RES is technically possible, if certain conditions are fulfilled. The basis for all of these scenarios, and a vital condition for maintenance of costs on a sensible level

whilst assuming the security of energy supply are for European countries to actively cooperate in respect of construction of cross-border connections and transmission networks.

System connection will allow for demand for peak power to be evened out, as well as for more efficient use of RES. In addition, new connections will minimise demand for reserve power. In the perspective of 2050, this means significant lowering of costs. According to the analyses that have been carried out to date, the price of energy for scenarios encompassing use of energy from RES falls within the bracket of the energy price levels assumed for the base scenario. Investment costs will be high, but once the necessary infrastructure has been put in place, operational costs will drop dramatically.

The macroeconomic influence of this type of transformation is also significant. According to the ECF study, the development of low-emission and efficient sources will not negatively impact upon the speed at which European economies develop. However, decreasing the energy-intensity of GDP will be a decisively positive move. During the last appraisal, generation of a unit of GDP will cost less than it does today. In order to achieve this goal, we must revise both EC and national legislation, in order to make it more precise. The development of energy efficiency, investments in clean technologies (e.g. CCS) and renewable sources, as well as development of intelligent networks and transmission networks should all be priorities.

Mr. Grzegorz Onichimowski, President of the Management Board of Towarowa Giełda Energii SA (POLPX) made a presentation entitled „The Market – a guarantee of national energy security”. The speaker focused on the significance of security of supply, which he characterised as infallibility of supply with simultaneous fulfillment of the condition of acceptable price.

To start, Mr. Onichimowski noted that in today’s day and age the state is not in a position to maintain investments related to energy, regardless of the support mechanisms that are in place. In order to ensure competitiveness in the sector, investments should also be executed by private companies. At present, management within the sector must take place with the aid of the market.

Competitiveness could be ensured by means of market coupling and creation of a European market. Another important challenge is development of a transborder network and implementation of mechanisms that would allow for maximum use of networks (allowing for flow of energy from locations with lower prices to locations with higher prices, thereby allowing for peak demand levels to be balanced out).

According to Mr. Onichimowski, one of the most important tasks faced by the sector is optimisation and development of transborder connections. The energy market is in

essence a capital market, so good examples such as the exchange or settlement chamber should also be implemented here. In August 2010, the so-called *obligo* (an obligation on part of the value of the energy freely available on the market) will be introduced in Europe. This will ensure the greater liquidity of the market. Another step should be *market coupling*. Western Europe is acting on the assumption that a common energy market should be set in place by 2015. An energy market should be set up for the „old EU“ by 2013, after which the remaining member states will gradually be connected. In the opinion of Mr. Onichimowski, a better solution would be development of a regional market which could be joined with the Western European market at a later date. In conclusion, the President of POLPX stated that creation of a competitive energy market as a mechanism guaranteeing energy security is just the beginning. In order to achieve success we must also create an efficient market for energy raw materials and other products.

The next presentation, made by **a representative of Ernst &Young, Mr. Stanisław Poreba**, regarded issues connected with financing of energy investments. The scale of necessary investments can vary wildly, depending on the assumptions that are adopted. It is possible that the new technology for capture of CO₂ will be quickly mastered and implemented, as was the case in relation to SO₂ technologies. In this case investments and costs could be significantly higher than those generally forecast. We currently do not have the conditions for adoptions of such assumptions, so as to be able to foresee all of the possibilities at this moment in time.

It is undoubtedly the case that the need for investment in the sector is huge. To illustrate, the exchange of carbon powers should take place at a level of at least 15 GW (up to 30GW). Diversification and security of supply account for a further 15GW, whilst extension of the transmission network should encompass approx. 10 thousand km and reconstruction of the distribution network – a further 200 thousand km. Execution of such a broadly construed programme requires an annual investment of approx. PLN 12-15 billion. In the case of calculation of energy prices, this level will additionally be raised by 20-30% by capital costs. This is a highly ambitious task, which can be compared to **re-electrification of the country** (as discussed by prof. Żmijewski), but we must remember that other member states are also in the same position (e.g. many generation units used in connection with German coal-based electricity generation have been in operation for over 50 years). We have the chance to find partners that we can cooperate with in solving these and other problems.

The issue of finding financing for our needs is a problem that must be addressed. Through coverage of energy prices, end users can supply approx. 60% of the necessary

funds. National aid funds and EU structural funds can supply another 25 – 30% of the required sum (depending on income to the budget from CO2 auctions). Simultaneously, the high price of CO2 will reduce the possibility of increasing capital costs in the price, which will certainly impact upon the level of investments.

There are no simple solutions and mechanisms that do not impact upon Polish consumers. This will, in turn, limit the potential for economic growth within the country (even blue certificates will bring about an increase in costs).

Presenting potential means of financing, Mr. Stanisław Poręba turned attention to the fact that in Poland even PGE is still too weak to be a market player functioning on similar principles to entities such as RWE or Vattenfall. It is vital that conditions are created that will allow Polish companies to be competitive not only on the European energy market, but also on the capital market. In order to sustain a high level of economic growth, we should seek means allowing for some capital costs to be transferred to the period after 2030. We should seek to identify cheaper solutions, e.g. through introduction of obligations providing the option of purchasing energy. It is estimated that a sensible solution, in economic terms, would be transfer of at least one third of capital costs to a subsequent time period.

In summary, it was stated that reconstruction of the energy system is unavoidable. Standard financing structures will not ensure execution of the required programme without stunting economic growth. We must seek diverse, system-based solutions. It is also worth turning attention to issues relating to public aid, market standardisation and financing specific sources from EU funds. In conclusion, Mr. Poręba appealed to the European authorities for the planned tempo of changes was adapted, in the context of European law, to technological and financial possibilities.

The presentation of **Mr. Marek Różycki, President of the Management Board of „Kozienice II” Sp. z o.o.**, concluded Session II.

One of the basic aims of the European Union is to ensure energy security. Each member state should be able to ensure coverage of demand for fuel and power, in a technically and economically viable way, taking into account environmental factors. As a result, programmes aimed at slowing down the global warming process and lowering greenhouse gas emissions (e.g. the 3 x 20 programme, CO2 limits) are appearing. However, limitation of CO2 emissions by 20% will be particularly difficult for Poland, as our energy sector is mainly coal-based.

Having made this statement, Mr. Różycki presented a brief overview of the challenges faced by the ENEA Group. These included: increasing ENEA's participation in the electricity market and restitution of generation sources. In light of increased demand for

energy, the ENEA Group has also started work on a new project – Kozenice II, which entails construction of a new power generation unit with net efficiency of 44.5% and a level of CO₂ emissivity of 0,728 t/MWh. This will be a „capture ready” unit, the capacity of which will be 1000 MW. It will be highly efficient, be characterised by low emissions in the context of hypercritical parameters, and will start to be built in 2011. Analyses and testing as to the conditions for transfer of power show that in all the scenarios taken into consideration, generation from the new Kozenice unit will be efficient. In turn, analysis of the competitiveness of generation of energy in a 1000MW unit shows that the location of this unit is competitive in the context of the level and value of the electricity ultimately generated.

At present, ambiguous legal provisions in respect of CO₂ cause a level of uncertainty amongst investors, which can in the future lead to the necessity of building more CCS installations. This will, in turn, bring about an increase in investment costs and lower the efficiency of electricity generation (due to increased individual demand). We have a choice: we can either build using the best possible technologies, or we will be forced to increase costs. It is, however, worth remembering that these costs will be borne by society.

SESSION III

ENERGY EFFICIENCY

Leading of the session: PhD Arkadiusz Węglarz, Secretary of the Energy Efficiency Working Group, the Public Board of the National Programme for Reduction of Emissions, Sustainable Development Director, The Polish National Energy Conservation Agency

The first speaker was **Mr. Michał Machlejd, President of the Management Board, SPEC SA**, who presented „Actions aimed at reduction of CO₂ emissions and increasing the energy efficiency of the Municipal Heating System in Warsaw.” SPEC SA has been transmitting and distributing heat for over 50 years. The Municipal Heating System in Warsaw is one of the largest in Europe (as illustrated by the characteristics of this network: 1700 km in length, 14 347 individual heat exchange points and 523 group exchange points, coverage of 75% of municipal needs). It is composed of the heating systems in Warsaw, as well as the suburbs of Międzyzylesie and Ursus (there are 5 additional boiler rooms here), which are powered from 3 power plants and 2 local heating systems.

Mr. Machlejd then listed investment activities undertaken by SPEC SA, which are aimed at increasing energy efficiency and reducing CO₂ emissions

- Exchanging the canal network to a pre-isolated one, which will significantly reduce transmission losses (limitation of heat losses connected with transmission by approx. 50K GJ/year would lead to limitation of CO2 emissions by approx. 4.7K t/year, whilst the maximum possible limitation of heat losses (achieved through exchanging the canal network to a pre-isolated one) would save approx. 1K GJ/year and therefore lower CO2 emissions by 94K t/year);
- Exchanging group heat exchange points to individual heat exchange points, as well as exchanging low-parameter networks to high-parameter networks (which would lead to an estimated reduction in heat losses of approx. 25K GJ/year and a reduction in CO2 emissions of approx. 2.3K t/year);
- Equipping individual heat exchange points with automatic steering equipment (limitation of heat losses by about 120K GJ/year, which will allow for reduction of CO2 emissions by approx. 11.3K t/year);
- Connection to the network of units powered by individual local boilers (abolition of low-emission sources, which will lead to limitation of heat losses by approx. 1.5K GJ/year and limitation of CO2 emissions by approx. 14.5 t/year);
- Development of an intelligent heating network, i.e. a programme aimed at optimisation of the management process, faster identification of losses and breakdowns, and introduction of new solutions, including IT solutions (which will allow for reduction of losses resulting from optimisation of network management by approx. 600K GJ/year and limitation of CO2 emissions by approx. 56.5K t/year).

The next part of the presentation was devoted to new areas for development and opportunities connected with modernisation. As Warsaw currently has an excess of heat, the company would like to connect new entities to the network, which will also lead to an improvement in energy efficiency.

Concluding his presentation, Mr. Machlejd presented a statistical analysis relating to improvement of energy efficiency by 800K GJ/year. This is not a huge number, but it can still be increased by both distribution companies and end users (through improvement of the energy efficiency of buildings).

The next presentation, which was devoted to the topic of energy efficiency as a chance at ensuring the security of energy supply and reduction of CO2 emissions, was presented on behalf of Director Henryk Majchrzak **by Mr. Andrzej Guzowski, chief specialist in the Energy Department, Ministry of the Economy.** Improvement of energy efficiency is one of the most ways of increasing energy security, limiting CO2 emissions, and thereby

avoiding climate change. Improvement of energy efficiency is a priority, both in the context of PEP 2030 and EU policy.

Directive 2006/32/EC on the efficiency of end use of energy and energy services points to two main issues – definition of indicative aims in respect of conservation of energy and creation of institutional and legal incentive mechanisms. The main task should be to get rid of barriers to effective use of energy, and also to create conditions for the development of the market for energy services and other means of improving efficiency. The directive also defines the national indicative aim in respect of energy conservation (9% in 2016), indicates the public sector as fulfilling an exemplary role, demands identification of a controlling and monitoring body and obliges the energy sector to carry out services benefiting energy end users. The solutions proposed by the directive also include a white certificates system or voluntary agreements scheme.

The main aims of the PEP 2030 in the context of execution of the Energy and Climate Package are: reduction of the energy-intensity of the economy to the level of the EU-15 and achievement of zero-energy economic growth.

Mr. Guzowski then went on to consider the scope of the Energy Efficiency Act, which is one of the tools stimulating pro-efficiency undertakings. The Act defines the national aim in respect of energy-saving energy management, which is 9% by 2016, identifies the tasks of public sector entities in respect of energy efficiency, as well as the principles of obtaining and redeeming white certificates. The entities encompassed by these regulations are: end users, enterprises being suppliers of means of improving energy efficiency, as well as energy companies selling energy to end-users. The indicative aim in respect of energy savings during the period up to 2016 (4,5 Mtoe) was discussed, as were the means of achieving this aim. The presentation also identified, on the basis of the building housing the Ministry of the Economy, the potential for improvement of the energy efficiency of public sector, which is to play a key role in prudent energy management. The basic mechanism introduced by the Act that is to stimulate pro-efficiency behavior is the white certificates system.

Certificates will be issued in respect of investments aimed at: increasing energy savings on the part of end users and individual need equipment, as well as lowering energy, heat or gas losses borne in connection with transfer or distribution. The President of the Energy Regulatory Authority will be obliged to issue and redeem certificates, as well as to announce tenders. In conclusion, Mr. Andrzej Guzowski presented the state of works in respect of the Act and a schedule for implementation of the white certificates system.

Dr. Sławomir Pasierb, Chairman of the Working Group for Energy Efficiency – CBNPRE, Director for Research and Development – Foundation for Efficient Use of Energy, made a presentation in respect of the influence of energy savings on the competitiveness of the Polish economy.

Dr Pasierb noted that by behaving more and more efficiently we will be able to increase the competitiveness of specific sectors. Efficiency has a significant impact on the economy as a whole and yields great potential in respect of lowering of costs. This was illustrated with the example of the implementation of the EU ETS, where the potential for increasing the efficiency of electricity use leads to significant lowering of the costs of supplying energy to the national whilst simultaneously reducing CO₂ emissions. In respect of energy generation, there is extensive potential for saving energy. The mere fact of closure of old 5000 MW power plants and construction in their place of new power plants can lead to achievement of increased efficiency (from 34 – 35% to 43 – 44%), lower fuel (coal) usage and price (by 3.6 mln Mg/year) and savings of 1.11 billion PLN/year). This brings about lowering of the emissivity of energy production from 1.023 kg CO₂/kWh to 0,802 kgCO₂/kWh, lowering CO₂ emissions by 8.4 million Mg CO₂ and increased employment in connection with investments (63,000 per year). In the case of heat generation, thanks to development of efficiency we can achieve approx. 7-8% greater efficiency and lower heat losses borne during transmission by 3 – 5%, but in this case the effects in 2020 will be decreased as a result of decreased demand for network heat (thermo renovation of buildings). The potential for reduction of CO₂ emitted in the heating sector is 12-15%.

The speaker then went on to discuss the influence of energy savings on the competitiveness of the Polish industry sector. As a result of increasing competition and the need for modernisation, between 1996 and 2007 the Polish industry sector gradually increased the efficiency of energy use and limited its energy-intensity. Energy-intensive branches such as steel production, cement, partially chemicals, were significantly modified, but in light of the costs of energy these branches are on the border of competitiveness. The distance between energy-intensive industries (e.g. production of pulp and paper) and the best technologies is huge. We have the potential to lower energy use by 10-15% in support system technologies: pumping, compression, ventilation etc. MSP potential is not well known – approximations suggest 20-40% savings can be achieved. In turn, in the case of buildings the potential for energy savings is still very high, and there is technically a possibility of halving energy use.

In order to achieve the highest possible level of savings within the Energy Efficiency Working Group of the CBNPRE, a road map indicating specific actions that must be taken in order to increase energy efficiency has been elaborated. The following steps must be taken during the period from 2010 – 2014:

- Elaboration of a Green Paper on Energy Efficiency in respect of institutional and systematic solutions;
- Achievement of a European level of energy efficiency (in k€PKB/toe) by 2025;
- Creation of new market mechanisms such as ESCO, ERS, PPP, TPF, DSM;
- Use of energy efficiency in the municipal housing sector up to the level of 28 – 30%, and in industry – 25 – 27% (by 2025);
- Development of rainbow systems, including white certificates;
- Introduction of pro-efficiency taxes.

When executing the above aims, we must ensure the coherence of any mechanisms actually implemented. It is also necessary to adopt an individual approach to efficiency, depending on the sector in which it is to be achieved. Realisation of potential can be a means of improving the competitiveness of Polish goods and services. Energy-intensive sectors such as metalurgy, cement, heaving chemicals, which require solutions to be created as EU level so as to avoid „escape – production – emissions” to countries that do not have CO2 regulations in place.

Mr. Andrzej Szymański, President of the Management Board of Landis+Gyr Sp. z o.o., presented conditions for the development of ESCO-type firms in Poland. ESCO firms offer services and undertake actions in respect of lowering the costs of energy for consumers. The activity of this type of entity revolves around financing pro-efficiency undertakings and taking on the risk of return on investments by settling investment costs through set-off from savings on client accounts. This is a formula that is well known in Europe, where actions are aimed specifically at state and non-profit organisations. There are relevant legal acts allowing for execution of such undertakings, especially in the construction sector. Projects that can be carried out in the ESCO formula in Europe include thermo modernisation, energy audits, modernisation of heating, sewage and ventilation systems, energy certificates, passive buildings.

Introduction of new regulations has allowed for the ESCO formula to be introduced in respect of electrical energy. Under the ESCO framework, energy companies can offer i.a. implementation of systems for load management or modeling of burden lines. A new solution in this respect is the concept of smart grids. Pro-efficiency activities will be supported by regulations connected with white certificates. In the coming years, we will be able to expect consolidation of services connected with remote readings and servicing of metering data by means of various media. In this respect, energy companies and also end users will be able to achieve savings. The ESCO formula would not exist if it were not for the awareness of end users, which is why one of the main assumptions of the smart grid is to increase end users’ awareness, thereby lowering energy use.

In summary, Mr. Szymański stated that the ESCO formula is well sanctioned in EU legislation. There are also the first examples of its functioning on the Polish market. This is a very good form of promotion of pro-efficiency activities, which would allow for implementation of innovative technical solutions also in the energy sector.

Following this, **Mr. Krzysztof Kołodziejczyk, Adviser to the Management Board, Globema Sp. z o.o.** made a presentation entitled „*Smart Grid: future or present?*”. In today’s world, the energy sector is becoming more and more complicated. The sector faces many challenges connected with the remodeling of the market. In order for the sector to remain competitive, it must carry out its activities with the support of a new generation of IT systems. Implementation of such systems will influence changes in the energy paradigm and lead to realisation of its full productivity. With this in mind, it is vital that a mechanism for foreseeing fluctuations in production from dispersed sources is put in place, security is increased, large network areas are managed, end users are encouraged to be more active, and management of infrastructure and supply is optimised. All of these goals and actions are supported by *smart grid* systems.

A solution to this challenge can also be provided by Globema’s *ElGrid* system, which allows i.a. for work optimisation and optimisation of the functioning of the network, forecasting of demand for energy and definition of the burden placed upon networks. The main tasks of this type of methods are dynamic management of networks with connected dispersed sources and energy resources, forecasting of RES production, automatic management of distribution, development of micro-networks and energy clusters, extension of AMR systems to Demand Response Tech., with use of Home Area Network solutions guaranteeing inclusion of clients so as to allow them to play a more active role in the market.

Mr. Krzysztof Kołodziejczyk then presented *smart grid* projects currently carried out throughout the world, their potential, and also the tasks that stand before this type of system in Poland. He presented potential areas in which clients can be encouraged to become involved in the system, e.g. through construction of AMI with ensured return and use of a price impulse.

There are many solutions within the *smart grid* concept, each of which addresses a different need and group of clients. However, a minimal requirement of the system is possession of an energy infrastructure system allowing for construction of an intelligent network. This is the first step that must be taken by Polish energy companies in order to allow efficiency to actually take place. Without such activities, investments in modernisation will not be optimised.

The next speaker was independent expert **Dr Ryszard Śnieżyk, PhD**, who spoke of the benefits and drawbacks of the ESCO model in Poland. According to Dr. Śnieżyk, the most important element of ESCO is the fact that an external company not only invests but also designs and purchases equipment, after which it can recover its money if the required effect is noted. This regards all energy systems. Modernisation leads to lowering of costs. The ESCO method is the best way of increasing energy efficiency without use of public funding.

Thus far, Dr. Śnieżyk has implemented four projects within the ESCO framework. In one of these projects, after 3 years the use of coal in a heat plant (POLAR S.A.) was reduced by 18,000 tonnes. This brought about a 100% increase in the feasibility of the entity in question. However, risk factors such as: employee sabotage, compensation for heating system failures, complicated methods for calculating economic impact, fiscal audits (2 UKS audits), difficulties with obtaining money and seasonal sale of household electrical items, are all barriers to implementation of ESCO.

As a result of the modernisation process carried out in the specialist hospital in Słupsk, a new heating system was introduced without use of the hospital's funds, and the costs of heat supply were lowered. The average monthly cost of heating after the modernisation was 46, 532 PLN (in comparison to the earlier sum of 102,000 PLN), and the costs of heat supply were cut by approx. 55%. A difficulty was that the company carrying out the project was to redeem its costs after a relatively lengthy period of time.

Dr. Śnieżyk also discussed a project carried out in a housing association in Nowa Ruda. On the basis of metering of heat use, a new volume of heat (which was 50% lower than before) was ordered. The funds obtained in this manner (600,000 PLN, i.e. approx. 30% of the annual costs of supply of heat) will be used for further modernisation works. As a result of the project, the structure of the heating network will be changed, heating points will be modernised and grouped together, and dispersion of prepared hot water for utility purposes will be carried out. These actions should bring about a 30% reduction in energy use.

Dr. Śnieżyk also expressed the view that the following factors are barriers to the development of ESCO projects in Poland: lack of social awareness, lack of understanding of the risk taken on by ESCO companies, attempts to force changes in the provisions of agreements where these are already being carried out, difficulties with securing the interests of ESCO companies, the unwillingness of suppliers to change the level of heat they have ordered, as well as – notably – corruption.

In order for projects of this kind to have a chance of survival, it is vital that knowledge and experience are possessed, that subsidies and loans are eliminated, and that works carried out in connection with the project are graduated in order to allow the company to

earn money on further stages of modernisation and to make use of any savings made without the need to involve partner funds. There should also be regulations allowing for the reliability of clients to be checked.

Ms. Tuula Ruukonen, Manager, Nordic, Baltic & UK, Fortum Power and Heat Oy, discussed solutions aimed at increasing energy efficiency. At the beginning of her presentation, Ms. Ruukonen pointed out that in the case of activities connected with efficiency it is often the case that we cannot use our capabilities to the full extent. This is the case because there is still a lack of the specialist knowledge, necessary resources and means of financing in many sectors. Regardless of these difficulties, pro-efficiency programmes will be carried out, and if EU directives provide additional incentives to do this, then this will only be an additional positive impulse. The most important step forward is the change in the level of awareness of the issue, as well as the understanding that we can and should undertake actions in this respect with a specific view to economic and environmental factors. It is vital that the prominence of efficiency as a key priority is increased, both in politics and the economy. The human factor will be instrumental in bringing about the necessary changes. There is still a lot to be done in respect of convincing society to significantly save energy. An important task is to convince society and employees of the significance of this topic. It is possible that financial incentives may prove a viable solution. It is, however, imperative that companies have a vision and mission showing that energy efficiency is incredibly important allows for achievement of a high level of savings. It is specifically in this respect that systematic action should be undertaken and specific analyses allowing for diligent portrayal of saving potential should be carried out. Possibilities for exchanging information in respect of increasing energy efficiency should also be identified.

Fortum independently implements a broad range of efficiency-related projects and is compliant with treaties and agreements concluded in this respect. It conducts analyses, identifies goals, implements projects and monitors their results. Many companies across the globe act in a similar manner; however not many of them share their experiences; try to disseminate knowledge and information as to best practices. Even if competition exists, it is still very important to exchange experiences. ESCO firms should share their experiences with others.

It is often necessary to invest large sums in order to significantly improve efficiency, but even small steps in this direction can yield positive results. Ms. Ruukonen highlighted that in the case of execution of projects increasing efficiency, it is very important to have diligently executed audits based on transparent data.

Energy efficiency is not only connected with the energy sector – there are many places in which we can achieve a lot, so as to make the economy more competitive. Thanks to efficiency, we do not only have to focus on construction of new power plants, but rather also have the chance to modernise old generation units. The costs of efficiency are high, but the scale of savings is impressive. In addition, it is possible to obtain a very good return on any investments in the case of this type of project.

The topic „Will market mechanisms alone be enough to breathe life into the power generation and transmission system? - conclusions“ was discussed by **Mr. Wojciech Hann, Partner, Deloitte, Central European Energy and Resources Team**. Mr. Hann presented the thesis that we are in the position whereby Poland and Europe face the problem of bridging a curious underinvestment gap. There is no going back – investment must come about. The scope of uncertainty is heightened by the issue of believable forecasting of demand for energy. Simultaneously, new investments face barriers relating to the instability of the regulatory system, which is connected with limitation of CO2 emissions. It is vital that an answer is found to the question of who will invest and to what extent. An additional difficulty is the fact that some companies have lower chances on the market – energy companies partially or wholly owned by the state treasury are half a step ahead when it comes to execution of investments than other companies. For this reason, many companies decide to suspend planned activities in order to wait for an increase in energy prices, which will allow for new investments to be realised. Another barrier is the time-scale of the investment process. For as long as there are no financial instruments, the life-span of which is proportionate to the investments time, we will struggle with the issue of refinancing risk. Similar dilemmas will be visible in Western Europe.

How can this situation be resolved. It is vital that action is taking that is aimed at ensuring that the Polish government has an active impact on the regulatory system and on decisions made at EU level (e.g. The derogations connected with CO2 emissions should be supplemented by derogations in respect of NO_x). For entities active on the market this will be an additional value impacting positively on investment decisions. A task for the authorities should also be to contemplate setting in place a role that – aside from ensuring competition – could also be responsible for ensuring that there are secure conditions for re-investment in the energy sector.

Mr. Wojciech Hann stated that we should actively shape the market and influence the mechanisms that modify it. With this aim in mind, clear and justified prognoses should be regularly published and submitted to criticism from all market players. This type of

activity could fuel further discussions as to whether the level of wholesale prices will allow for investment.

Issues connected with short-term indecisiveness in respect of EU decisions, access to long-term investments and addressing the shortfall in power, which can affect the Polish market in a few years' time, will remain problems faced by the Polish energy sector for some time to come. For this reason, the entities that are active on the Polish market should have the priority of working together and discussing possibilities for resolving this situation.

SESSION IV

CLEAN CARBON TECHNOLOGIES

Leading of the session: Tomasz Podgajniak, President of the Management Board, CDM Sp. z o.o., former Minister in the PM Marek Belka cabinet

Ms. Joanna Strzelec – Łobodzińska, Undersecretary of State in the Ministry of the Economy, then made a presentation entitled „Increasing the relevance of coal to the Polish economy in the context of reduction of emissions”.

Ms. Strzelec-Łobodzińska began by listing the most important challenges that the Polish economy faces. These include: significant carbonisation and energy-intensity, a high level of amortisation of generation-related assets, dependence on external supplies of oil and gas, current and planned environmental protection regulations. The dominating participation of CO₂ emissions in the fuel balance is of great significance (in 2009 over 55% of energy was generated from hard coal, whilst another 34% was produced from lignite coal; extractions was also significant). We face the necessity of simultaneously maintaining competition and economic growth. The adopted directions of the energy policy are aimed at solving these problems and creating conditions for the improvement of energy efficiency. Emphasis has also been placed on the development of RES, clean coal technologies and nuclear energy. If we could achieve all of the assumptions of the PEP 2030, then assuming that economic growth will not bring about increased use of energy, Poland will achieve the aim of reducing energy use by 20%. However, a key issue is the impact of the actions being undertaken on energy prices in Poland. EU policy, and also Poland, have placed emphasis on diversification of energy sources, in particular zero-emissions sources such as RES and gas.

The current government is preparing a programme of clean coal technologies, the implementation of which will require enormous investments, but which will allow for the efficiency of generation of energy from coal, limitation of greenhouse gas emissions and development of new, high efficiency technologies for generation of electricity or heat. The

means and funds that will be used for this type of activities will also be indicated. The most prospective include the issue of raising the efficiency of procuring fuel and generating energy (doubling production from cogeneration), improving the quality of coal, transformation of coal to liquid and gas fuels, use of coal waste and research work. From the viewpoint of the EU, the most developmental are CCS projects, in which Poland also intends to actively take part.

The debate devoted to the issue of 30% reduction in CO₂ emissions in Poland is a key condition of further development of the industry and energy sector in Poland. The European Commission believes that the main burden of this type of obligation will rest upon the new Member States. A new proposal is to change the approach to purchasing of CO₂ at auctions taking into account the specific characteristics of the Polish economy. The government suggests adopting principles, on the basis of which free allocation will be possible for every type of production, taking into account the best available technologies (BAT).

It is also very important to ensure that Poland is not dependent on import, which will ensure energy security and allow for own resources to be used.

Mr. Andrzej Siemaszko, Secretary of the Working Group for Clean Coal Technologies – Consultancy Board of the National Programme for Reduction of Emissions, Director of the National Contact Point in Poland touched upon the issue of the possibility of developing clean coal technologies. He noted that the difference between the European Commission and us is that Poland approaches the issue in a broader manner, far exceeding the issue of mere CCS. The Polish Flagship Programme that is currently being elaborated should create a political, organisational, economical and legal framework for the development of clean coal technologies. Moving in the direction of this type of technology could be beneficial for us also from an economic standpoint. For this reason, experts connected with the Consultancy Board of the National Programme for Reduction of Emissions („**CBNPRE**”) are preparing a programme for internet diversification of energy sources and the assumptions for a research programme that will develop Polish areas of speciality in a degree allowing Poland to become a leader in this area.

With regards to CCS, we are aiming to take part in tenders for EU funds allocated to the development of projects in Bełchatów and Kędzierzyn. Highly advanced research in respect of the possibilities for CO₂ storage and geological works are currently being carried out. The IGCC gasification technology allowing for production of hydrogen (Kędzierzyn) is opening up new horizons for us. It is vital that issues connected with the

transfer of CO₂, as well as the possibility of pumping it with the aim of enriching oil extraction, are resolved.

The following milestones have been indicated in the road map prepared by the Working Group for Clean Coal Technologies of the CBNPRE:

- Elaboration and implementation of a financing mechanism;
- Choice of CO₂ beds;
- Analysis of means of transportation of CO₂;
- Construction and exploitation of CO₂ storage beds and pipelines;
- Research in respect of CCS technologies;
- Participation in the EU CCS Demo and procurement of experience in this respect;
- Construction and operation of two demo CCS installations;
- Planning and construction of new *capture ready* installations;
- Construction of a power plant equipped with full CCS technology and construction of industrial plants with CCS.

An additional programme will encompass construction of generation potential in respect of synthetic gas. Further tasks include identification of geological coal, oil and gas sources in light of CTW, execution of research in respect of UCG technologies (underground gasification), construction and exploitation of infrastructure for EOR/EGR or ECBM and construction of gasification plants, CTL, CTG (production of synthetic gas and liquid fuels on the basis of synthetic gas) with a CCS installation. This will allow for construction of additional capabilities, which would be highly beneficial for Poland. We have the chance to become a leader in respect of issues relating to underground coal gasification, carbochemistry, geological exploration, construction of geo-reactors and geo-storage tanks for CO₂, and can capitalise on this going forward.

The last speaker of this session was **Dr Leon Kurczabiński, Director, KHW SA**, who represented Mr. Stanisław Gajos (the President of the company) in making a presentation in respect of the prospects for development of hard coal during the period up to 2030. Access to coal beds means that Poland has quite large degree of independence in energy terms. At present, we could cover 100% of national demand on the basis of coal alone. Both electricity and heat obtained from coal (in particular, lignite coal) are amongst the cheapest forms of energy. The operative coal resources currently available in respect of hard coal will allow for us to be independent for at least 50 years, whereas in the case of lignite coal this period extends to 100-150 years. As a result of implementation of the Energy and Climate Package, coal has ceased to be an asset and has become a barrier to the economic development of the country. Imposition on all

member states of the same framework, without taking into account local conditions, is a mistake.

In the mining sector, there is increased demand for investments relating to operation of new beds. The sector is in a worse position than the energy sector, as it operates on the competitive market and must therefore adapt prices to prices on international markets by lowering costs. In order to maintain competition, it is vital that actions are carried out in respect of monitoring demand for coal, especially in the context of transferring to other energy sources (RES, atomic energy). The situation in the heating and transport sectors is also unclear, which means that the mining sector is in a state of expectation as to events on the market.

KHW is planning to undertake further attempts at privatisation. Actions have also been initiated in respect of concentration of extraction with the possibility of regulating production on a global scale, which will allow for costs to be lowered.

SESSION V

RENEWABLE ENERGY SOURCES

Leading of the session: Grzegorz Wiśniewski, Member of the Working Group for Renewable Energy Sources – Public Board of the National Programme for Reduction of Emissions, President of the Management Board of the Institute for Renewable Energy

The panel began a short presentation supplementing the speech of **Minister Joanna Strzelec – Łobodzińska**, who conveyed the newest message connected with the arrangements made by the representatives of the Polish government with Commissioner Connie Hedegaard. The Commissioner approved an application in respect of the definition of physically initiated investments – this will be dependent on an appraisal carried out in accordance with national law, i.e. In the case of Poland in accordance with the definitions set out in construction law. Minister Strzelec – Łobodzińska concluded by saying that „we are now only awaiting written confirmation”.

The first presentation of Session V was made by **Mr. Grzegorz Wiśniewski, Member of the Working Group for Renewable Energy Sources – Consultancy Board of the National Programme for Reduction of Emissions, President of the Management Board of the Institute for Renewable Energy**. It was aimed at indicating the role of RES in execution of the Energy and Climate Package. Currently works are being concluded in respect of the national action plan for renewable energy, which will be an

executive programme for the coming 10 years. Development of use of alternative, renewable energy sources is highly relevant in the context of complex implementation of the aims of the Energy and Climate Package, including a key element thereof – new Directive 2009/28/EC, which sets out a legally binding obligation for Poland to achieve 15% participation of energy from renewable sources in the final energy balance for the period up to 2020. Without an accepted programme, or an overlying strategy for the next decade, actions are undertaken in order to implement the directive by amending the Polish Energy Law (in respect of green electricity) and the act on biofuels. However, we are still not looking at our actions in a systematic way, and we are not attempting to optimise the RES sector and integrate our activities with the entire Climate Package.

Successful implementation of the new directive is a huge challenge. The decreasing participation over the last few years of RES in the balance of final energy use is a problem that can indicate selection of an incorrect strategy in respect of support for RES, as in spite of the increase in the participation of green electrical energy and biofuels, the general participation of RES, calculated as per the new directive, is not increasing. Such a state of affairs results mainly from transfer of the biomass stream from individual heating (which currently has the largest share in the RES market) to less efficient markets. This is why it is important to verify the actions that are undertaken and to think as to whether there is justification for further support of co-combustion of biomass and coal with green certificates, or promotion of biofuels. We should also take into account that there are a few modern, fast-growing sectors such as the solar and thermal energy sectors, as well as the agricultural waste biogas sector, which means that we can achieve the 15% aim set before us in the context of 2020 without the risk of depleting the current agricultural and forest biomass markets.

It is worth highlighting that we have rich and well-diversified renewable energy sources that have thus far practically not been used. The analyses of the Institute of Renewable Energy show that we can not only achieve the 15% aim, but also 21%. In order to do this, however, we would need to take decisive corrective action and avoid drifting towards an inefficient system. It is not resources that are the problem, but lack of investment, as well as excessively one-sided accentuation of biomass; it is clear that if – in accordance with the current energy policy – 80% of energy from renewable sources is to originate from biomass, this is too much. The situation is leading to an excessive increase in pressure on biomass resources, which – assuming use of more and more inefficient conversion technologies (co-combustion, estrification) leads to an increase in prices and biomass, as well as the energy produced from it.

With the end of June 2010, the Ministry of the Economy will conclude works on the national plan for use of RES. The role of RES in the national programme for reduction of emissions is also being discussed. It is vital that all necessary elements and

implementation instruments are included in the draft documents currently being elaborated, as if something is not included in the plan, which is scrupulously monitored by the Commission, then there is a very small chance that this solution of technology will exist on the market during the period up to 2020. The Working Group for RES of the CBNPRE has prepared a social road map for RES for the period up to 2020. The plan should encompass: development of distribution and low-voltage networks, more efficient decision-making procedures, implementation of a plan for maritime wind energy (the energy and climate equivalent of nuclear energy), increasing the efficiency of support systems, and development of microgeneration. The issue of local activity and activation of local governments has also arisen, without which it is difficult to imagine successful implementation of the new directive and promotion of RES and the entire Climate Package.

The next speaker was **Mr. Krzysztof Nosal, Director – Environment, Arizona Chemical**, who raised the issue of the possibility of executing a sustainability policy in respect of promotion of use of energy from renewable sources. Article 17 of directive 2009/28/EC speaks of renewability criteria in the context of biofuel and bioliquid policy.

Mr. Nosal briefly introduced Arizona Chemical, which is the largest company in the world conducting biorefining of tall oil and is a leader in production based on pine chemicals.

Tall oil is a co-product of production of cellulose. Distillation of tall oil produces substances such as fatty acids, rosin, and sterols, which are used in the production of various everyday products such as biodegradable oils, chewing gum, polygraphic paints, tires, fuel additives, varnishes. If tall oil is recognised as a valuable source of renewable energy and its combustion is subsidised, this can lead to a situation in which it will no longer be feasible to use it to generate the aforementioned products. They will then be replaced with other products which have a much higher carbon footprint.

Much is said about the need to adopt a harmonised approach to the criteria of sustainability, and attention is focused on added value, creation of workplaces, generation of RES and the environmental aspect. However, creation of incentives for use of tall oil as an energy source will not lead to sustainable development, but rather will increase emissions and have negative effects – destroys economic value, lead to production of small amounts of renewable energy, and also to an increase in CO2 emissions. The carbon footprint of the products of refining tall oil is much lower than that of their substitutes, even those that are plant derivatives.

In summary, Mr. Nosal states that use of tall oil in energy production will have a minimal impact on achieving aims in respect of use of renewable energy, and will in addition bring about an increase in CO2 emissions. That is why we should not subsidise activities that

do not bring about sustainable results. There are more examples of the negative impact of one-dimensional subsidies (e.g. co-combustion of valuable wood in the particulate boilers of high-power electricity plants lead to an increase in its price, which had a negative impact on the paper and furniture industries).

Mr. Krzysztof Müller, Head Manager, Business Development/M&A, RWE Polska

SA. Discussed competition within RES from the perspective of a sector investor. RWE is an investor in RES, as it believes that this will be a constant and important element of the electricity system. When looking at potential sources of energy they also look at their economic viability, but on the other hand the price of energy cannot be separated from the environmental and security related aspect. We should aim to achieve a situation where we can supply energy at a price that does not limit the competitiveness of the economy.

On the free market, there is not just one price for a given technology. This is dependent on a calculation of the investment costs in a given instance, the time-span of the investment, means of use of existing sources and the costs of primary energy. As a result, when one set of assumptions is taken into account wind energy can be cheaper than RES, and when another is taken into account it can be more expensive.

There is a series of energy generation technologies that foresee a cost of less than 70 € in respect of limitation of CO2 emissions. These include wind farms established both on land and in the sea, as well as biomass. We should develop renewable sources where they work best and are cheapest. For example, project Desertec assumes maximisation of the efficiency of conversion of primary energy by matching the type of source to local conditions. This approach is not widely used in practice, as it requires the architecture of the network to be adapted and cooperation with non-EU countries to be established, whilst the existence of EU member states is not acknowledged.

The reality is that we have European aims that are transferred to specific countries. Under Polish conditions, 3 directions for development of investments that are worth making are the most effective – overland wind energy, constant biomass (all uses) and biomass in the heating sector. Projects from within this scope are to be economically viable, ensure security and be environmentally friendly, although another factor that must be taken into account in this context is social acceptance. There are many additional factors that must also be considered – natural conditions, the cost of logistics, the stability of the support system, co-existence with other sectors, etc.

Investments in renewable sources cannot be reviewed separately from the entire power system. A potential solution to the situation is revision of the system, which is currently not prepared for the development of RES (which is why this is so expensive). By

introducing changes such as large-scale energy storage, air compression, and electric transport as support for energy storage, this situation could be changed. According to Mr. Muller, it would be helpful in the context of achieving the 15% aim if broad activities were undertaken in respect of: investment in sources, amendment of the structure of the network and management of means of energy storage.

Mr. Tomasz Chruszczow, Director of the Climate Change and Atmospheric Protection Department in the Ministry of the Economy, stood in for Minister Bernard Błaszczak in concluding the discussions in respect of RES.

RES should be viewed in the context of reduction aims, combating climate barriers and supply of resources. The long-term perspective indicates that it is worth looking at the requirements of climate policy in a more constructive way. The aim for Poland is 15%. The 20% aim is also not just simple reduction of emissions, but also involvement in projects developing renewable energy. At this point in time, there is also an economic context to energy security and dependence on external supply. Access to renewable sources is limited by nature itself. We also have a short-term aim, which is achievement of 7.5% participation of energy from renewable sources in the energy balance in 2010. In order to achieve these tasks, support is vital. This support would be ensured by green certificates, EU funds, green investment schemes. The green investments system takes money earned via the sale of the Polish excess achieved as a result of execution of the Kyoto protocol and uses it to achieve further reductions. This type of use of the AAU excess is unique in the context of other countries across the globe. The National Fund will invest in plants using biogas, thermomodernisation, improvement of the efficiency of transport. The Ministry of the Environment is also involved in promotion of the GreenEvo (Accelerator of Green Technologies) project, one of the main priorities of which are renewable sources, including photovoltaics.

Poland's coal-intensity is still high, and the main reason for this can be found in the energy and transport sectors. From this perspective, the role of renewable energy can be highly significant. Appropriate use of RES and their combination with other sources can create conditions for the development of energy security in Poland.

To conclude his presentation, Mr. Chruszczow relayed the newest information from the European Commission in respect of works on the IED Directive. As a result of the compromise that was reached between the European Parliament and the Council, the majority of the derogations previously negotiated have been maintained.

SESSION VI

ENERGY FROM WASTE

Leading of the session: Tomasz Podgajniak, President of the Management Board, CDM Sp. z o.o., former Minister in the PM Marek Belka's cabinet

Ms. Beata Kłopotek, Director of the Waste Management Department, Ministry of the Environment made a presentation entitled „Waste and ensuring the energy security of the country.”

Ms. Kłopotek presented a hierarchy of waste management proceedings: avoidance of creation of waste; preparation for re-use; recycling; other redemption methods, including restitution of energy and storage. The main tasks that must be undertaken in the nearest future are: reduction of storage of bioegradable waste and preparation for re-use, recycling of 50% of paper and cardboard, plastics, glass and metal obtained from household use and similar sources (which will limit restitution of energy but is legally sanctioned). Whilst bearing in mind that we have a specific aim in respect of recycling, we can still state that there are waste resources that can be used in connection with energy production.

How can we obtain energy from waste? By means of direct combustion in a combustion plant (in Poland there is one such plant, in Warsaw), or generation of so-called alternative fuel burnt in industrial plants and fermentation of waste and combustion of the methane produced in this manner. Works are currently being conducted on strategic documents relating to waste management (a national waste management plan; a national action plan in respect of energy from renewable sources and direction for development of a biogas plant in Poland between 2010 and 2020). In light of the fact that elaboration of these documents lies within the remit of several institutions, it will be incredibly important for there to be harmonisation in execution of the policy.

Funds for execution of waste-to-energy projects can be obtained from the operation programme „Infrastructure and Environment”. National funds are also available, via national and regional environmental protection and water management funds.

Ms. Kłopotek also discussed the legal framework for waste management, which includes:

- The Act on Waste (both the current and revised versions);
- The Regulation of the Minister of the Environment of 2 June 2010 on specific technical conditions for qualifying part of the energy redeemed from thermal transformation of buildings (an incentive to construct communal waste combustion plants) has already been referred for publication;

Draft regulation of the Council of Ministers in respect of fees for waste storage (currently being prepared).

Mr. Jean-Michel Kaleta, President of the Management Board of SITA Polska Sp. z

o.o. Focused on the conditions for development of waste combustion plants in Poland. Waste can be burned as mixed communal waste or some fractions can be used in the production of alternative fuels (such plants already exist in Poland).

The speaker noted that the obligation to limit the amount of biodegradable waste that is stored will not be achievable during the period between 2010 and 2013. The amount of biodegradable waste that is to be deposited in storage plants is approx. 6 million tonnes, whilst the law allows for storage of only 3 million tonnes – the remaining waste should be subjected to redemption processes. With such large amounts, these assumptions can only be achieved with the assistance of combustion.

An element encouraging construction of combustion plants is the possibility of qualifying part of the energy originating from combustion as renewable energy (which is an important part of emissions reduction policy). For thermal transformation plants this will also be an important element of the economic breakdown (sale of energy).

What is missing in order for Poland to start to develop? The first task is to convince society. With this in mind, a series of information-related actions must be carried out. Clear and concise communication is required, and a stream of waste for the investment must also be ensured. A legislative change is also necessary, especially in the case of the act on maintenance on cleanliness and order in gminas, a manifestation of which is the assumption by gminas of ownership of communal waste.

A key element in the context of development of investments is maintenance of the competitiveness of combustion in relation to storage, as it is commonly accepted that combustion can cost ten times more than storage. It is vital that actions are carried out in order to raise the competitiveness of combustion in relation to storage, which is still significantly cheaper. The simplest solution would be in this case introduction of a tax obligation, i.e. introduction of fees for storage of waste. A new increase in „marshall's fees” should be planned, in order for the amount of fees for waste storage to approach the level of preliminary fees in waste combustion plants, and fees for waste other than communal waste should be increased. Another important task aiding greater efficiency in the case of installations can be lowering of the costs of waste management for citizens.

The development of combustion plants in Poland will be a success if we can build a full waste management cycle, rather than focusing on individual installations. We must approach the issue in a complex manner and take into account all available means, such as the possibility of co-combustion of alternative fuels, development of mechanical and biological processing, co-combustion in power plants and development of new storage sites.

Conclusions and closing remarks - the road maps of the National Programme for Reduction of Emissions

Summarising the sessions, **Mr. Maciej Sokołowski, Executive Director of the Secretariat of the PBNPRE** presented the remaining road maps of the National Programme for Reduction of Emissions. The road maps of the PBNPRE were created as a result of a movement towards optimisation of the process of reduction of emissions as a basic climate protection tool. Each road map contains actions that must be undertaken within a specific amount of time. Thus far, the Board has created 8 road maps:

- Clean technologies (Session IV);
- Energy efficiency (Session III);
- RES (Session V);
- The market and competition;
- Restitution of sources;
- Exchange mechanisms;
- Nuclear energy;
- Energy security.

In order to develop the **market** and **competition**, the following actions must be undertaken:

- Implementation of an intra-day balancing market;
- Introduction of regional balancing of power and an active DSM;
- Implementation of a market for system power services;
- Introduction of „return on capital” regulations – the „price range” of services;
- Strengthening and broadening of the exchange market;
- Introduction of white and rainbow certificates;
- Conduction of ownership unbundling;
- Realisation of the ongoing programme of installation of quarter-hourly meter readings with duplex;
- Propagation of use of a social services chip card.

In respect of **restitution of sources**, important tasks include:

- Elaboration of instruments supporting RES and the development of dispersed cogeneration;
- Closure of unfeasible, old power generation units and modernisation of existing units;

- Creation of new production capacities and creation of a plan for financing of new generation capacities;
- Creation of a good investment strategy;
- Development of new, low-emission technologies, CCS (demonstration installations);
- Creation of a Polish nuclear energy programme;
- Improvement of energy efficiency.

In the case of the road map relating to **market mechanisms**, the following actions must be carried out:

- Creation of a biomass exchange;
- Privatisation of POLPX and conduction of changes in its shareholding structure;
- Servicing of the balancing market;
- Introduction of market coupling;
- Development of a balancing market for the gas sector at exchange level;
- Introduction of the status of liquidity provider in respect of derivatives, an exchange obligation and rainbow certificates;
- Conduction of ownership unbundling;
- Introduction of gas to the market.

Implementation of **nuclear energy** requires:

- Adaptation of Polish law and control over nuclear activities;
- Conduction of location studies, cost studies, environmental impact appraisals and research in respect of uranium resources available in Poland;
- Identification of the necessary technology, creation of a business plan and choice of partners;
- Choice of locations for power plants and waste storage facilities;
- Training of personnel and development of a scientific and research body.

Poland's energy security requires execution of the following actions:

- Improvement of the state of medium and low-voltage networks;
- An increase in national gas extraction;
- Construction of co generative gas sources;
- Development of transborder connections;
- Predestination of sources for development of bio methane;
- Estimation of the impact of CO2 costs;
- Choice of directions for investments in clean coal;
- Creation of networks of dispersed sources;

- Agreement upon a tax system and reference discount rates;
- Introduction of white and rainbow certificates.

The PBNPRE plans to create maps and atlases in respect of such issues as decarbonisation of transport, diversification of clean technologies, networks, smart grids, and strategic investments.

All road maps and atlases will be consulted with as extensive a group of end users as possible. Public consultations will be carried out on an ongoing, constant basis, and information on all aspects of PBNPRE's work and the results of any activities carried out will be available at: www.rada-npre.pl.

CONCLUSION

The aim of the VI International Conference NEUF 2010 – New Energy User Friendly - „Public consultations in respect of the road maps of the National Programme for Reduction of Emissions” was to increase social awareness, dissemination of information, broadening of the consultation process and intensification of works on the form of the National Programme for Reduction of Emissions, which implements the Energy and Climate Package adopted by the EU.

The event gathered together several hundred top-class experts and representatives of opinion-making environments actively working to achieve implementation in Poland of a sustainable development strategy, as well as a special guest – EU Commissioner for Climate, Ms. Connie Hedegaard, who listened to the Polish standpoint in respect of the provisions of the Package and possible adaptation strategies, and also passed on some information of key importance to the development of the Polish economy. Commissioner Hedegaard confirmed that she will look favorably upon the Polish view in respect of the concept of physical initiation of the investment process, if it is confirmed that this is compatible with national law (i.e. in the case of Polish law – compatible with the definition set out in construction law).

The outcome of the conference will also have a significant impact on the continuation and acceleration of works on formulation and execution of the National Plan for Reduction of Emissions.

All of the presentations, speeches and discussions mentioned in this report were recorded, and the relevant footage has been placed on the webpage of Procesy Inwestycyjne Sp. z o.o., at: www.proinwestycje.pl. Viewing and downloading of these materials is free of charge.