

### The Financing of Power Industry Investments in Poland

May 2011





It is our honour and pleasure to provide you with this report on the power industry in Poland. Having gone through deep changes in the field of regulation, organisation and property structure, this branch is facing new challenges now. The regulatory requirements resulting from the EU laws and regulations, as well as the technical condition of our production and distributive infrastructure, generate great investment needs, estimated PLN 170 billion within the period of the following 10 years. In our report we focus on the analysis of these needs and the potential sources of financing them.

We would like to thank all the persons who found the time to share their views and opinions on this sector with us.

We hope that this report will become a strong voice in a discussion which is crucial not only for the future of the power industry, but also for the Polish economy as a whole.

Thus, we invite you to read our report and share your views and comments with us.

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### **1. Introduction**

Five years ago the experts of ING Bank in Amsterdam and London issued a report depicting the condition of the Polish power industry, written from a perspective of the then tendencies and changes on the European market. This report gave a photographic view of the sector's condition in April 2006. It indicated, inter alia, the need of an immediate investment in building new generation capacities, as well as the transmission and distribution infrastructure. The necessary investment expenditures in the sector were then estimated EUR 10-16 billion within a decade. The report also predicted the most probable trends and changes. However, it was prepared in a reality that was completely different from the world we live in today. There were no vertically integrated power industry groups, the companies did not consider dividing the distribution and the turnover, the change of energy provider within the TPA seemed unreal, the investment credits were still secured by the infamous KDT (long-term contracts), and the transactions made at the Energy Commodity Exchange generated maximum 1.5% turnover on the market.

This publication is an attempt to create a similar picture of the energy sector at the beginning of 2011, but the grounds for it are different. It is a picture seen by the analysts and experts from outside the sector. A picture watched in a context of rising ecological requirements, which result from a growing concern of the EU leaders for the influence of human activity on the natural environment. The authors of the report are deeply convinced that the challenges of the energy sector do not concern only this particular branch. The energy safety is what we all care about. And the financial and consulting institutions are fully aware of the role they are meant to play in the accomplishment of the long-announced investments, essential to preserve this safety. Together we search for answers to the most basic questions: what does the energy sector in Poland look like today? What challenges does it face? What difficulties can be noticed? What are the real investment needs? What expenditures they require? Is it possible to finance them within the next few years? Are the statements on the necessary investments from the 2005 report still in force? What withholds the investments? And is the lack of access to the financing the main problem of the sector?

As a result, we give you the conclusions from our observations and research. The authors of the report do not give a ready solution for the problems of the sector. However, they search for the reasons why since 2006 no new generation blocks have been built, which would be crucial for the National Energy System. It has not happened despite the concordant statements of the branch specialists that each year we should deliver 1500 MW of the new capacities, so that we will not be deprived of electricity in the foreseeable future.



# 2. Investment needs in the power industry sector





### 2.1 Situation in electrical power engineering

For the last few years, Polish power engineering had gone through some breakthrough changes concerning the regulation, structure, organisation and property matters. The factors that triggered these changes were mainly the necessity to adapt the domestic regulations to those binding in the European Union and to create the entities strong enough to finance their own investment needs. The most significant regulatory changes in the European Union, which have an impact on Polish energy market, are the following:

- by virtue of the EU Directive 2003/54/EC of 26th July 2003 concerning common rules for the internal market in electricity, the following were divided:
  - regulated net activity in the field of distribution and transmission and the related regulatory system services
  - regulated activity in the field of generation in the highduty sources working in unison and in the renewable energy sources
  - non-regulated activities in the field of generation in condensation and trade
- introducing the system of CO<sub>2</sub> emission rights trading, by virtue of the Directive 2003/87/EC of 13th October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community, and the European Parliament Directive 2009/29/EC of 23rd April 2009, changing the Directive 2003/87/EC.
- preferential regulations in the field of generation in high-duty sources working in unison and in the renewable energy sources, resulting from the EU Directive 2004/8/EC of 11th February 2004 on the promotion of cogeneration and the EU Directive 2009/28/EC of 23th April 2009 the promotion of the use of energy from renewable sources.

In addition to the abovementioned, in Poland regulation was also introduced by the means of:

• liberalization of the prices of energy in all the segments of the trading by virtue of an communication of the President of Energy Regulatory Office (Urząd Regulacji Energetyki, URE) of 31st October 2007. The execution of this communication has been withdrawn for the individual clients, the so called G Tariff (about 24% share of the market) • financial restructuring by means of dissolving the longterm contracts on the purchase of power and energy (so called KDT) by virtue of the Act on the rules of covering the costs of the producers, arisen from the premature dissolution of the long-term contracts on the purchase of power and energy.

What is particularly worth noting among the **structural and organisation changes** is a significant consolidation of the sector, including the constitution of two vertically integrated leaders, GK PGE and GK Tauron. Two other newly-created energy groups have a different profile – dominated by distribution and trade to a high extent (Enea) or completely (Energa), and they are meant to undergo more structural changes, as a result of the pre-planned property changes.

Within these property changes, a partial privatisation of PGE, Tauron and Enea has been accomplished, and currently the process of the privatisation of Energa is open.

The above mentioned changes had taken place just before the start of the great **investment programme**, which resulted mainly from the need of the following:

- the exchange of the generation equipment, the economic life-span of which is ending
- the exchange of the generation equipment, the ecological effectiveness of which is below the level accepted by the law that is meant to come into force at the beginning of 2016, by virtue of the EU Directive 2001/80/EC

on the limitation of emissions of certain pollutants into the air from large combustion plants (LCP), the EU Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants, limiting of SO2 and NOx emissions and the proposed Directive on the industrial emissions – integrated prevention and control of the pollution.

- the exchange of the generation equipment for the equipment of a higher energy efficiency (the average energy efficiency of the generation blocks in Poland amounts to about 35%, in comparison to the new units' efficiency reaching about 45%),
- modernisation and expansion of the distribution grid, due to the necessity of the following:
  - minimising of the grid's limitations (generation in the force on mode, power evacuations from the particular energy sources, infrastructure of the cross-border connections)

- minimising of the technical losses by way of the technical modernization
- elevating the level of its reliance by way of optimising the configuration of the grid (among others, by creating the power supplying loops) modernisation and expansion of the switching grid of the voltage of 110 kV or less, due to the necessity of the following:
- minimalisation of the trade and technical losses by way of introducing the relevant telemetric solutions
- elevating the level of its reliance by way of optimising the configuration of the grid (among others, by creating the power supplying loops), as well as limiting the participation of overhead lines)
- the expansion of the grid enabling to connect new clients and expanding the base of the clients
- connecting to the grid and receiving the energy from the adjustable renewable energy sources (most of all, the wind energy sources)

The current, more consolidated structure of the electric power engineering significantly facilitates the obtaining of the financial means and the access of the biggest companies to the capital market. However, the scope of this financing remains a great challenge.

#### 2.2 Power generation

## 2.2.1 Conventional power industry

The sector of electric power engineering has a strategic importance for every modern country's development. The moderated development of this sector is a vital condition for ensuring the country's energy safety, and the crucial element of this development is keeping the safe level of energy supplies, which will satisfy the domestic demand, with competitive prices and respect for the rule of law, including the environmental regulations and social expectations.

It is expected that within the following 10 years great changes will concern not only the demand, but also the supply; however, the most significant of them will take place in the field of the structure of supply.

For the last few dozens of years, the consumption of energy in Poland has been characterised by the interim seasonality, meaning the maximum increase of demand in winter and maximum decline in summer. For years, a more rapid rise of energy consumption in summer and a bit slower in winter have made an interesting trend. The most probable explanation of this phenomenon is a larger number of electronic devices, used all year round, and the growing number of the air condition devices, set to work mainly in summer. These changes in seasonality of the demand increase the extent of utilisation of the available generation capacities, not only in the winter, but also in the summer, i.e. the greater part of the year.

In Poland, the cross-border exchange has a limited meaning when it comes to creating demand and supply. In the entire European Union, this exchange does not exceed 10% of one year's production, and in Poland it is even lower. Simultaneously, in the case of Poland the existing cross-border connections are used more in the technical purposes then for trade. The reason why it happens is the influence of the neighbour systems, such as the roundabout flows caused by the wind power plants located in the north Germany. Thus, in the moment the significant shortage of the domestic generation abilities could not be effectively replaced by the energy import by way of using the working inter-system connections. Due to the limitations in the cross-border exchange, it is difficult to count on the possibility of re-selling the significant surplus of the energy produced in Poland (if it occurred) to the recipients abroad.

#### Graph 1. Generation and consumption of energy in Poland in the period 2005-2010 (GWh)



Source: ARE (Agencja Rynku Energii - The Energy Market Agency, ARE)



#### Graph 2. Prognosis of gross energy consumption in Poland (TWh)

\*Accomplishment of 2010 in accordance with the ARE

Source: ARE, Ministry of Economy, "Energy Policy of Poland until 2030" Attachment 2. "Projection of demand for fuels and energy until 2030"

he current prognosis of energy consumption in Poland depicts the interim increase within the next 15-20 years to the level of 1-3%. When taking the energy supply into consideration, after the already done great changes in the field of regulation, consolidation and privatisation, equally important changes are expected in the field of investment.

There is no doubt that the crucial segment of the power industry in Poland, which affects the scale of the joint energy supply in the country, are the professional power plants connected to the Domestic electric Power Engineering System (KSE), which also remains in accordance with the situation of the other European countries of the Poland-like size. The role of the diffused power industry is marginal and, regardless if reflecting on the medium or even long period it is difficult to expect significant changes in this field. Moreover, the new carbon or nuclear technologies are based on building bigger and bigger energy blocks, and this favours the continuing trend of the concentration of the energy generation.

Currently, about 50% of generation is concentrated in two entities (PGE and Tauron), and the next 23% belongs to three other owners (Enea, EdF and ZE PAK).

### Graph 4. Key energy producers in Poland – the installed powers (GW)



Graph 3. Energy generation in Poland by the source (TWh):



Based load power plants (including the Combined Heat and Power)Other sources (industrial and other independent ones)

Source: ARE

Source: Own work on the basis of the publicly available data

**Graph 5. Key energy producers in Poland – the** share in production (2009)



Source: Own work on the basis of the publicly available data

Although the existing generation powers are sufficient to satisfy today's demand, it is often heard that it may be difficult for Poland to cover the future demand in a stable way, which may result in the limitations of the electric supply or, in the worst case, paralyse the functioning of KSE. A great part of the existing energy blocks is highly over-exploited and it will have to be switched off in the coming years. Meanwhile, the state economy is still developing and - though the pace in which the demand for energy grows is disputable - it is highly probable for this demand to rise. Apart from the technical consumption of the existing generation units, in the coming years new expectations may occur in the field of environmental protection and the old blocks may turn out to be non-competitive in comparison to those using the new technologies. As it is estimated, until the end of 2020, the shut-down of the blocks of joint power of 7GW (of the existing 36GW) will be necessary. The problem with keeping the current generation potential is a crucial threat to satisfying the energy demands in a stable way.

blocks in Poland (MW)	
8000	

Graph 6. Projection of shut-down of the energy



Source: Ministry of Economy, "Energy Policy of Poland until 2030", Attachment 2. "Prognosis of demand for fuels and energy until 2030"

 $^1$  EU Directive 2003/87/EC revised by the EU Directive 2009/09/EC established the system of circulation of the greenhouse gasses emissions in the European Union, which makes it possible to reflect the CO<sub>2</sub> emission in the variable costs of the power plant.

### The shut-downs of units caused by their technical consumption and low competitiveness

The great part of the power in Polish electric power engineering is highly over-exploited and it will reach the end of its life-span within the next 10 years. Almost 45% of the generation powers have been working for 30 years and about 33% - for 20-30 years. Meanwhile, these blocks, the life-span of which is not ending, and which will fulfill the tightened environmental protection norms in the following years, may become non-competitive. The consequence of this age structure and technical condition of the Polish power plants is the low efficiency of the energy blocks. Simultaneously, in the course of the last few years only two new units have been delivered (Pątnów II i Łagisza), and the start of the third one (Bełchatów 13) is planned for this year. Jointly, the above mentioned units have the accessible capacity of 1.8 GW, which makes about 5% of the capacities installed in KSE. The difference in efficiency between the majority of the blocks used in Polish power industry and the blocks constructed in the new technologies amounts to 10 percentage points (35% vs. 45%). This depicts how much carbon and the rights to CO<sub>2</sub> emission the old generation units have to consume in comparison to the units based on the supercirtical and ultracritical technologies, which means the higher variable generation costs<sup>1</sup>. Moreover, a part of the modernisation investments in the old blocks - necessary in terms of fulfilling the environmental norms - decreases their efficiency to an even higher extent. It can be said that from the perspective of the sector and economy as a whole, taking up the economically unjustified modernisations of the old blocks will result in the increase of the energy prices with no visible and permanent benefits in the field of granting the economically functioning generation capacities.

#### The shut-downs of the units caused by the environmental expectations

By virtue of the EU regulations [EU Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants (LCP), the EU Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants, limiting of SO2 and NOx emissions and the proposed EU directive on the industrial emissions (IED), since the beginning of 2016 the new norms on the environmental protection are to come into force. In connection to the above and the fact that currently all the producers of energy in Poland use most of all the high emission carbon technologies, the problem of adapting the blocks to the new environmental requirements will concern almost all in the comparable extent. The units which will be unable to fulfill the environmental requirements will have to be shut down until the end of 2015. Only a small part of them will obtain derogations and will be allowed to function until 2023, under the condition that they would not work more that 20 thousand hours in the period between 2016 and 2023 (in comparison, one year's working time of a power plant at full bearing weight amounts to about 8 thousand hours).

#### The necessity of investing in the generation capacities

The level of the installed power in KSE on the 31st December 2010 was 36 GW. In the approved "Energy Policy of Poland until 2030" an assumption was made that the level of the installed power KSE in 2020 should amount to about 44 GW, meaning it has to grow by 8 GW. In the same document it was assumed that until 2020 the planned and predicted shut-downs of the generation powers will reach jointly 7 GW (apart from 4 GW requiring the deep modernisation). What results from the juxtaposition of the above changes, is the construction of the new generation powers amounting to 15 GW within the next 10 years. The investment processes currently being accomplished, along with the investments planned by the energy groups until 2020, jointly reach 14.8 GW of the new installed powers. The joint value of the planned investments in the generation powers amounts to more than PLN 100 billion.

The new investment trends will be influenced by the conclusions drawn from the mentioned supremacy of the new technologies, as well as the EU regulations requiring the increase of the share of power from the renewable energy sources (Odnawialne Źródła Energii, OZE).

## 2.2.2 Renewable electric power engineering

At the moment, what makes the greatest share in the structure of electric power production from the renewable sources, is the co-combustion of biomass in the existing carbon energy boilers and water power plants. Both these sources jointly give about 75% of the production of electric energy from renewable sources in Poland.

During the EU summit in March 2007 it was stated that until 2020 20% of the electric energy produced in the EU will come from the renewable sources. For the particular countries, this target has been diversified, depending on the initial situation and the potential in the field of the energy production from the renewable sources – Poland has been





Source: URE (Urząd Regulacji Energetyki - Energy Regulatory Office, URE)

obliged to reach 15% share of the renewable energy in the joint amount of the produced energy.

#### Wind

One of the most dynamically developing branches of the renewable energy industry is the wind energy industry. In the entire EU in the period between 2000 and 2007, only the new gas installations were invested in more often than the power wind industry, but already in 2008 it became the most popular investment target. In 2008 alone the power installed in the wind power plants increased by 8.5 GW and reached 65 GW. It is estimated that until 2020 EU should dispose of even 180 GW of the installed capacity in the wind power industry, which is to cover the 13% of the demand for electric energy.

The two leaders in the field of the wind power industry in Europe in 2008 were Germany (almost 24 GW of the installed capacity) and Spain (almost 17 GW). At that time Poland was 13th in the EU, with no more than 0.6 GW which is 0.8% of the joint installed capacity in the wind power plants in the EU. Compared to the other renewable energy sources, the wind power industry is developing dynamically enough in Poland. According to ARE in the period between 2007 and 2009 the capacity installed in the wind power industry increased from 123 MW to 715 MW.



Graph 8. Wind energy in Europe (the capacities installed in the end of 2008)

Source: EUROSTAT

The greatest proportional power increase (by almost 135%) was reported in 2007. At the end of that year, the power of Polish wind power plants amounted to more than 307 MW, which made 23% of the entire capacity installed in renewable sources.

#### **Biomass**

The second type of renewable energy – after the wind power – that has a huge potential is the utilisation of biomass in the power plants, including those basing on this material. At the moment in Poland we have 10 working biomass plants of joint installed electric capacity of 9.5 MW and the heat power of 9.8 MW.

Similarly as in the case of wind power, currently the production of energy from biomass has only a small share in the general power industry balance in Poland, mainly because of the limited access to biomass, higher unit investment expenses and higher costs of energy production in comparison to the one based on carbon. In particular, the investments in biomass plants are encumbered with high location risk - connection to the grid (electric power grid, heat power grid, gas power grid), operational risk consisting of the constant necessity of monitoring and the fermentation process supervision, the risk connected with granting the continuity of the proper fuel ingredients' supplies. The economic relevance of the investment in the biomass energy source relies on most of all - as it does also in the case of wind power - on the existing support systems, including the duty of energy reception and the green certificates. Also the surcharges to the investments in the renewable energy from the EU funds, as well as the support for the national programs of the special institutions such as National Environmental Protection Fund, give a strong impulse for investing. In the approved Domestic action plan in the field of energy from the renewable sources, the contribution of biomass (solid biomass, biogas, bioliguids) in the fulfillment of the targets binding for Poland in view of the share of the energy from the renewable sources in 2020 was estimated to reach 2530 MW of the installed capacity, including more than 2000 MW produced by the biomass plants.

Graph 9. Capacity installed in the wind power plants in comparison to the other types of the renewable source energy (in MW, at the end of 2010):



### 2.2.3 Nuclear Power Energy

The international nuclear industry is in full bloom at the moment. It seems that this trend cannot have been changed even by the tragic events in Japan a few months ago. On one hand, it is the necessity to satisfy the growing energy demand of the main global economies that is in favour of this phenomenon. On the other hand, it is the need to take the climate change and the assurance of the supplies' safety into consideration. At the moment such countries as USA and Great Britain, which succeeded in building the power industry based on the fissile materials some time ago start a new wave of investments. The countries presently increasing their generation powers based on the nuclear power industry, like India or China, fiercely increase the pace of its development. Countries like Poland, with no former experience in this area, are already in course of designing the new programmes of the nuclear power industry development or they seriously perceive it as one of the paths of this sector's expansion.

This significant interest in the nuclear power industry result from its exceptional supremacy over the other energy generation technologies in three main categories:

- the safety of the supplies the nuclear power industry guarantees a much greater safety of the supplies than the low – or zero-emission technologies (wind, solar energy, sea tides), due to the great fluctuations of the occurrence of the primary energy and the small production scale, as well as the gas technologies (such as CCGT - Combined Cycle Gas Turbine), mainly because of the gas supplies' instability risk.
- climate protection nuclear power industry is a technology that guarantees climate protection against the CO<sub>2</sub>, NOx and dust emission to a much higher extent than the carbon or gas-based technologies. However, the risk of radioactive radiance may occur in the situations of extraordinary disasters, which may result in the disturbance of the proper functioning of the security systems, the cooling systems etc. The case of the Fukushima Daiichi power plant illustrates this mechanism in the most dramatic way.
- low-cost exploitation the nuclear power industry, despite the significant investment costs, is characterised by economic exploitation, due to the low variable costs of production, which makes it more profitable than

the carbon and gas technologies (the radioactive waste is a separate matter). Taking all of the above into consideration, the Polish government decided on developing the nuclear power industry. As experience shows, it may take even 15 years from the moment when the decision was made to the start of the nuclear power plant's commercial activity.

At the moment Poland is facing the necessity of accomplishing a vast investment programme connected with the modernisation or replacement of the overexploited generation units in order to fulfill the tightened environmental requirements. If we take into consideration that more than 80% of the generation capacities is based on either the hard coal or the brown one and we confront it with the EU policy, aiming at the significant reduction of the  $CO_2$  emission, we can see clearly that keeping the competitiveness of the Polish economy requires the changes in the generation portfolio on a long run. The idea of starting the nuclear units seems to be the answer to the challenges that the economy is about to face, if we are meant to be provided with long-term energy supplies at a reasonable cost.

#### **2.3 Distribution and transmission**

## 2.3.1 Cross-border energy exchange

The significant reasons for the limited cross-border energy exchange are the low capacity of the energy crossborder connections and lack of sufficient motivation to build such connection. This approach results most of all from each country's care of maintaining independence in the field of energy. That is why the international exchange is only an addition to the domestic production. Another important factor is the question of justifying the costly investments that the building of these connections requires and the necessary re-construction of the domestic transmission systems in order to make it possible to use them. The power industry is one of the most capital-consuming sectors of economy. The investment expenditures for a given technology are similar in all the countries where it is used. The new technologies are standardized, and so are the costs of maintenance and renovations. The power industry is based on the resources, for which an international market exists, and the prices of these resources in the particular countries do not differ that much in longer periods.

The role of local factors, like labour costs, is not that significant as their share in the joint costs of energy generation is small. There are no sufficient premises to assume that there is a continued difference in energy prices among the countries, which would give an economical justification to the construction of a large number of international energy connections. Polish experience in building the cross-border connections also seem to confirm such justification.

On the other hand, the European Commission, whose policy aims at creating conditions for the energy circulation within a single market, sets its sights on the development of the cross-border connection in the EU countries. In order to meet these expectations, PSE Operator (the operator of power transmission grids in Poland, which is also responsible for the international connections) has also planned many investments in this field, including the ones at the German, Czech, Slovakian, Lithuanian and Ukrainian borders. The nearest of the assumed investments – the energy bridge between Poland and Lithuania which is meant to start functioning in 2015 – will cost about EUR 600 million.



#### Graph 10. Electric energy prices in Europe (tax-free, 1st half of 2010, EUR/kWh)

Source: EUROSTAT



**Graph 11. Cross-border connections** 

Source: Own work basing on the PSE-Operator SA data

### 2.3.2 Distribution and transmission within the limits of Poland

The cross-border connections are only one of the areas in the field of distribution and transmission, which require investments. More serious problems and higher investment expenditures concern the transmission and distribution grids within the domestic electric energy system.

Four Polish energy groups, the owners of most distribution grids in the country, plan to invest in this sector jointly almost PLN 30 billion until 2020. Other distributors have their investment plans as well, and PSE-Operator also plans to invest in the transmission grids. The necessity of investing in this sector results most of all from the fact that the currently working distribution and transmission grids are over-exploited and ineffective (they cause huge energy losses and their reliability is limited). Apart from that, the weakly developed transmission grids limit the expansion of the diffused power industry, based mostly on the renewable energy sources (wind, water, biogas power plants). On the other hand, their development is forced by the EU policy aiming at the increase of the share of renewable energy in the general energy balance. The diffused power industry will not develop unless the energy grids develop first. The latter ones are not only technically damaged, but also not prepared to receive the power from the diffused sources, particularly those, which are difficult to regulate (e.g. wind power).

Similarly as in the case of generation, the planned investments will be focused mainly on replacing the existing estate with the new and more efficient assets. In order to diminish the net losses, the distributive entities will have to get to accomplish the complex projects aiming at the replacement of the current system or the re-construction of the existing distribution grids of high, medium and low voltage (including, inter alia, the exchange of the low-efficient transformers, shortening very long power line sequences and changing the profile of the cords in order to adapt them to the current temperature in the grid). Moreover, the economic development and the growing competitiveness on the market will force the investments in the new final service connections.

The next factor generating the necessity of investments in the sector is the project of introducing the smart energy grids, which, according to the adapted commitments, shall have been accomplished by 2020 (until then, 80% of the recipients shall be provided with the smart watthour meters). According to the announcements of the government, the act on the smart energy grids shall have come into force by the end of 2011, and about PLN 7.8 billion will have been spent on the guidance programmes.



### 3. Factors determining obtaining financing for an investment





#### **3.1 Sector factors**

The investment plans of the energy entities in Poland, including the four biggest groups (PGE, Tauron, Enea i Energa), are developed and costly, they often exceed the market value of the company itself. This means that the companies will rather have to obtain the outer means to finance a significant part of the planned investments. In such situation, the financing institutions – judging the risk of financial involvement in the energy investment projects in Poland – will have to pay attention especially to the sector factors.

One of the most significant ones is the uncertainty of the regulations concerning the awarding of the free licenses to the CO<sub>2</sub> emission and the prices of these licenses in the next performance period and later. In December 2008 a derogation for Polish energy entities was negotiated. It entitles them to allocate the CO<sub>2</sub> emission licenses in the period between 2013 and 2020. The derogation concerns not only the existing installations, but also those under construction, if the process of investing in them started before the end of 2008 and if they are meant to have become a part of the EU-ETS system by the end of June 2011. It should be noticed that the talks with the European Commission on determining the uniform methodology of the free licenses' allocation are in progress. However, it seems that the admission of the methodology based on the benchmarks from 10% of the most effective installations in the European electric energy sector is inevitable. In this situation, the benchmarks will rely upon the lowemission power plants supplied with the petroleum gas. In the case of Polish power industry, which in 90% is based on the fossil fuels (hard coal, brown coal), the application of the "gas" benchmark would not be a beneficial methodology of the licenses' allocation, for it would significantly decrease their number. The necessity of purchasing the CO<sub>2</sub> emission licenses for a market price causes the increase of the energy generation costs, if the technologies used are based on the high emission of CO2. Such situation can induce the investors to change the investment portfolio in favour of the renewable power industry or to withdraw completely from the planned investments in the generation powers. Companies like RWE, Vattenfall or CEZ have already abstained from the construction of energy blocks of joint capacity of about 5.4 GW of the installed capacity in Poland. The 70% of this power was generated by the energy blocks based on the carbon technology.

Another factor affecting the institutions' judgment on the risk of the financial involvement in the energy investments is the lack of **decision of the overall liberalisation in the field of energy sale** in the context of the anticipated increase of the energy prices to the economically justified level. At the moment, the trade companies are still obliged to submit their tariffs to the President of ERO. His/her approval is vital when energy is sold to the ultimate individual recipient (the ,,G'' tariff). The slow pace of preparing the regulations in the field of the sensitive recipients' protection, as well as the political undertone of the potential decision on the energy prices' liberalisation for the tariffed recipients, in the perspective of the coming election will rather not result in rapid changes in this area. Keeping the economically unjustified tariffs for this group of recipients may affect the average price of energy on the competitive market, which can lead to the delay in decision-making on the start of the new investments in the power industry.

Another problem is the lack of clear approach to the shaping of the gas prices in the contracts on the purchase of this fuel after the future liberalisation of the gas sector. At the moment, gas is being sold at the tariffs approved by the President of ERO. Probably the obligation of submitting the tariffs for his/her approval will be cancelled within the next few years. While organising the financing for the construction of the generation sources supplied by petroleum gas, the investors have to enter into long-term contracts on the purchase and supplies of this fuel in order to secure these supplies after the start of the planned investment. The problem with entering into such contracts is the lack of a determined and negotiated gas price formula in the contracts for its purchase after the liberalisation of the gas prices for the industrial clients. Another factor that affects the judgment of the risk of the financial involvement in the investments is the planned change of the current regulations in the field of the renewable power industry, resulting from the duty of implementation of the EU Directive 2009/28/EC to the Polish legal system. Despite the expiry of the implementation deadline (December 2010), the preparation of the proposed bill on the renewable energy sources is in progress. The lack of information on the shape of the new system of supporting the investments in the renewable energy sources makes is impossible to judge the economic efficiency in a trustworthy manner and to estimate the financial benefits from this kind of investment. A specific risk in this area is the presence of certain limitations of the capital reimbursement in the regulations concerning the renewable energy industry, especially in the current situation connected with the economic crisis, which affects not only the State budget, but also the households.

Another thing is the lack of decisive legislative actions concerning the prolongation of the system called Financing the investments in energy in Poland 25 high-duty co-generation support – which, by virtue of the current resolution, ends in 2012. At the moment the electrical power and heating plants producing the energy and heat in the process of high-duty co-generation use the support system in a form of the sale of yellow and red certificates, serving as an additional revenue apart from the sale of energy and heat. The lack of the co-generation sources support systems' continuity will potentially cause the decrease of such investments in the future, particularly in the case of the units supplied by the gas fuel.

In regulated branches, such as the energy distribution or heat sale and distribution, the level of the companies' profitability and their ability to generate the financial means for the necessary investments, are strictly dependent on the current methodology of tariff calculation. In accordance with the general rule resulting from The Energy Law, the companies' tariffs should cover their justified operational costs, including the amortisation and the justified capital reimbursement. That is why the lack of clear approach towards the manner of determining the justified costs' level, as well as the rate of reimbursement of the capital involved in the heating industry, is another factor affecting the judgment of risk of these investments, performed by the financing entities.

In a regulatory practice, the level of justified costs, accepted by the President of ERO, often differs from the real operational costs of the companies being the subject of regulations which do not work in favour of them. Such attitude of the regulator aims at forcing the improvement of the companies' effectiveness. The President of ERO has also a great influence on the amortisation level included in the tariff, as he/she negotiates the companies' investment programmes with those companies. ERO determines as well the level of capital reimbursement for the regulated entities. What is particularly worth noting is that in the case of energy distribution, the rules of determining the sum reimbursed are precisely specified and do not raise any doubts in the companies. Meanwhile, in the heating industry, these rules (determined in October 2010) are described in a general manner and can be understood in many different ways both by the enterprises and the regional EROoffices (the tariff applications for the heating companies are approved by these regional offices, whereas the energy distributors' applications are approved in the main office in Warsaw).

Anther matter elevating the investment risk in the opinion of the financing institutions is the fact **that the manage**- ment boards work in terms and their composition changes frequently. The judgment of this risk is also influenced by the dividend policy in the context of the budget needs. The prices of energy affect the profitability of these investments in the electric energy sector and the possibility of obtaining the financial means for the investment projects. A significant factor shaping the level of these prices is the fuel prices (i.e. solid fossil fuels, gas, biomass, nuclear fuel). In order to prove that the electric energy prices are tied to the fuel prices, the margins introduced by the energy enterprises should be analysed. Such analysis is far too complicated and detailed for a report of such scope and purpose, so we attach below only a simplified analysis of the historic level of electric energy and fuel prices.

An average price of energy on the commodity market (run by the Towarowa Giełda Energii SA – Polish Power Exchange, PLPX) in 2010 amounted to about PLN 200/MWh. In the first month of 2011 this price was on a similar level as in the whole 2010. The selling price designed by the generation entities kept the level of PLN 190/MWh in the period between the first and the third quarter of 2010 (there is no data from the fourth quarter). The unit production fuel costs used for the needs of producing the sold electric energy in the first three quarters of 2010 made 52-56% of the selling price of energy however this share presented an upward tendency.

Graph 12 depicts the average quarterly energy prices obtained by the generation entities in the last 5 years, compared to the average unit fuel costs used for the production of the sold electric energy. To make these figures comparable in the whole presented period, the selling prices of the electric energy in the period between 2006 and 2008 were corrected by including the excise of PLN 20/MWh. This correction results from the regulations on the excise which came into force in March 2009 and encumbered the sellers of energy to the ultimate recipients with the excise duty (formerly it had been paid by the producers).

On the Graph we can observe the significant increase of the price of energy sold by the generators in 2009 in comparison to 2008. The price grew due to the essential increase of the fuel costs, although it was the hard coal it concerned to a bigger extent. In the first quarter of 2009 the price of hard coal for the power industry amounted to PLN 11.8/GJ - 29% more than in the fourth quarter of 2008 and 39% more than in the first quarter of that year. The increase of the carbon prices in 2009 was caused mainly by the inner needs of the Polish mines, which are the main resource





Note: due to the changes in the excise law from 1 March 2009 the average electric energy price for the first quarter of 2009 is not depicted on the Graph (there is no detailed data for this period, which makes it impossible to estimate the energy prices without the excise value)

Source: Own work basing on the ARE data

supplier for the domestic power plants and heat and power plants. In the period between the second and the fourth quarter of 2009 the increase of the carbon price was not that significant (1% in relation to the previous quarter), and in 2010 it even fell down, to the level of PLN 11.1/GJ in the third quarter. The stabilisation of the carbon prices was accompanied by the stabilisation of the producers' energy prices. From the financing entities' point of view, not only the fuel price (in relation to the energy price) is significant. Equally important are the suppliers' reliability and the time for which the fuel contracts are binding. Until recently, the hard coal contracts with the domestic suppliers were concluded for a year, which made it difficult to forecast the fuel prices in a long- or even a medium-term perspective. At the moment one can notice that the energy generators and mines become more and more interested in entering into the long-term contracts.

## 3.2 The scale of investment in relation to the scale of an investing party

A significant factor determining the possibility of obtaining the financial means for the given investment project is the scale (value) of this project in relation to the scale (value, cash flow etc.) of the investing party. The bigger the investment project in comparison to the investor, the more probable the risk that the project's fail will have a significant negative effect on the investor. In the worst case – it may lead to their bankruptcy. On the other hand, the bigger the investor in relation to the planned/implemented project, the smaller the scale of risk connected with that project for the investor. The same mechanism concerns the potential benefits for the project itself, resulting from the possibility of assuring the continued significant financial support for the project by the investor.

Due to the relatively small value of the Polish energy groups (PGE, Tauron, Enea, Energa) in comparison to the other European energy companies (vide: Graph 13 below), the accomplishment of the investments relevant to the demands of Polish power industry, may require the combination of different outer financing sources (credit, shares issue, bond issue).

Graph 13. Stock market capitalisation of the chosen Polish and foreign energy companies (in EUR billions, for 1st February 2011)



Source: Own work on the basis of the publicly available data from the Reuter's base

## **3.3 Advancement and stability of the power industry companies**

Another important factor influencing the risk judgment concerning the given company and investment project (meaning, the company's ability to obtain financing), is the current and foreseeable profitability of this company.

From the point of view of the suppliers of the debt and equity funding, the indicators of the company's ability to manage the debt is crucial. A popular indicator used by the banks is the net debt in relation to EBITDA (Earnings before Interest, Taxes, Depreciation, and Amortization) indicator, which seldom exceeds 3, and, from the conservative angle - the level of 2,5 is considered safe.

Energy groups in Poland plan significant investment expenditures within the next 10 years. The joint expenses may amount to PLN 170 billion (without the potential nuclear power plant in PGE). The question is: whether the biggest groups are able to finance the above expenses, basing on debt only (without obtaining the additional equity). The vast majority of planned investments should be accomplished within the next 6 years (due to the planned block shut-downs and the environmental requirements). The simplified estimates based on the planned financial results and the investment projects in PGE, Tauron i Enea (lack of information on the forecast financial results of Energa) and prepared on the assumption that within the next 6 years the energy groups will gain the stable EBITDA results on the real level similar to the prognosis for 2012 (jointly, about PLN 13 billion a year), indicate that these groups are able to generate about PLN 55 billion until 2016 from the existing installations (however, the potential negative effects of the new regulations concerning CO, are not included in this analysis). Thus, they will have to obtain about PLN 115 billion (about 2/3 of the investment value) from the outer sources.

Assuming the model of financing in the formula "project finance" and accepting that the optimal structure of the investment project financing consists in 50% of debt and in 50% of the means from the sponsor of the project (this structure reflects the target assumptions of URE in relation to the distribution companies), one can presume that PGE, Tauron and Enea will be able to obtain about PLN 85 billion of debt directly for their investment projects. The lacking amount of funding – supplementing the assets – in the amount of about PLN 30 billion, will have to be obtained by the analysed energy groups in the form of debt on their own assets or from the other sources.

Taking into consideration the current level of the consolidated net debt of PGE, Tauron and Enea, the forecast level of EBITDA of these groups for 2012 and the net debt in relation to EBITDA indicator, which is accepted by the institutions (about 2.5), we estimate that the three analysed groups can may still obtain about PLN 35 billion from their own balance, which makes it possible to accomplish the financing of all the assumed investments (except the nuclear power plant).

However, it is worth stressing that the above estimates do not include the possible lowering of EBITDA from the existing generation installations due to the necessity of purchasing the  $CO_2$  emission licenses. It may turn out that the amount of debt necessary to finance the assumed investments will be much lower than the above indicated PLN 115 billion and companies will not be able to incur such a high debt, basing only on their own balance sheets.



## 4. Financing of an investment





### 4.1 Outer financing

At the moment the fuel and energy sector in Poland, due to its dynamics and strategic character, is one of the most willingly financed by the financial institutions.

The majority of big companies in the sector obtain the financing mainly from their balance - with a full recount to the investor. However, the investments in the new generation capacities and transmission infrastructure may be financed in two different ways: both from the company's balance and the "project finance" formula.

### 4.1.1 Financing obtained from the companies'balance

Financing from the companies' balance (corporate financing) is practiced when the scale of the investment is adequate to the current size and the company's activity. In such situation, the net debt/EBITDA indicator usually does not exceed 3 in the whole financing period.

As a rule, the corporate financing is the most beneficial option of obtaining financing, taking the costs into consideration. It also gives far more flexibility in the accessibility of the credit means.

The crisis on the financial markets that began by the end of 2007 and deepened in 2008, caused the increase of the commercial banks' prudence when giving credits, including the investment ones. This bigger carefulness reflected in the higher requirements imposed on the companies, higher credit margins and the shortening of the financing period. In 2010, the situation in the field of investment credits improved, which caused, inter alia, the lowering of the margins. The financing from the balance is usually given for a 3-5 years' period. It seldom happens that the financing period reaches 7 years. In the cases when it exceeds 7 years, some elements of the project financing are included in the structure of corporate financing or the financing is organised completely in the "project finance" formula.

The risk that the financing institutions take while preparing the finance models for the ,,project finance" requirements (described in the section 4.1.2) causes the relative attractiveness of financing from the investor's balance to grow. Currently, there are no projects on the market, the financing of which would exceed the investors' ability to incur a debt (the mentioned three times EBITDA). That is why both the energy companies and the banks prefer the corporate financing model. It decreases the costs and allows them to avoid the complicated procedure used in the "project finance'' method.

The ability to incur debt from the balance is mostly connected with the size of the company. The bigger equity it possesses, the bigger its ability to generate EBITDA should be. And this increases the ability of the company to potentially incur a debt. Thus, the big energy groups naturally have a bigger possibility of obtaining this type of financing. This means that they can, theoretically, finance also these projects, the profitability of which would be difficult to prove on the base of the financial models. As experience shows, today it is possible to obtain even very big amounts this way. Let us use PGE as the example. Last year it announced the end of historically the biggest bond issue programme (worth PLN 10 billion), with the guarantee of the banks' taking in. A similar way of financing has also been successfully chosen by Tauron.

Today the balance financing is relatively cheap and easily accessible. It is reflected in the current interest of the banks in financing this sector from the companies' balances, which significantly exceeds the needs announced in the product enquiries.

It should be noticed though that, as a rule, banks use a lot of contractual clauses in order to secure their interests. Many of these clauses limit the freedom of the debtor's activity to some extent. These limitations concern usually granting the loans, guarantees, collateral on the assets, the changes in the property structure etc. In the case of the model of financing from the company's balance, such limitations affect the whole group. The case of the "project finance" type is different. Even though the structure of the contractual clauses is far more complicated, the limitations mostly concern the special purpose vehicles (SPV) and their influence on the freedom of the whole group's activity is smaller.

Another possibility of balance financing consists of treating it like a bridging finance for the investment period, until the moment of its closing and technical delivery. The delivered and working part of the enterprise can be separated, included in the SPV and refinanced with the longterm credit given directly to SPV. In such case - from the financing institutions' point of view - the risks resulting from the investment process get eliminated. This improves the comfort of the creditors in a significant extent and helps the investors save time and costs, connected with the banks' supervision of the investment process and the contractors' judgment of risk. Moreover, due to the fact that the credit refinances the investment in its finished form, free of the investment process risks, it can be granted on the conditions which are far more profitable than the usual ones.

As it has been mentioned before, the ability to gain financing on the basis of the balance is limited with the net debt/ EBITDA indicator. In a short or medium perspective the energy companies should not have any problems with this kind of financing. However, concerning the declared investment expenditures in the sector, which are meant to exceed PLN 200 billion until 2030. Is seems that such a model of financing cannot assure the pace of investing in power industry, which is necessary to keep the generation powers and distribution grids on the level securing the energy safety of a country. As a result, even the strongest entities will have to look for other forms of capital obtaining on a long run, if the ambitious investment plan shall be fulfilled in the sector.

## 4.1.2 Financing in a ''project finance'' formula

The investments demanding high expenditures in relation to their existing scale of activity require project financing. This formula is also chosen in order to limit the risk taken by the sponsor of the project or in the case when a large number of investors occur. The project financing is based on the assumption that the cost would be fully covered from the means generated by the project, with no recourse or a limited recourse towards the investors. Until now on the Polish energy market the "project finance" formula was used in the case of the wind plants. Preparing the project to be financed this way may take a couple of years. The stages of this process are:

- elaborating the conception of the project and, in the case of a larger number of investors, specifying the rules of their collaboration,
- preparing the feasibility study,
- obtaining the relevant licenses and permissions,

- environmental influence analysis and obtaining the environmental acceptance,
- formulating and negotiating the contract structure,
- preparing the tender and selecting the general contractor
- obtaining the financing for the project.

In the case of big projects, which require obtaining financial means from several or over a dozen financial institutions, investor usually collaborates with his/her consultant. The latter supports the investor in negotiating the contracts and preparing the project in such a way that the project can be financed by the banks later on. The consultant provides the investor with different options of financing the investment and helps in organising and coordinating this financing. Moreover, in the case of project financing, both the investor and the banks collaborate with the specialised companies which run the due diligence project analysis. When the projects concern the energy sector, the financing institutions must additionally perform a technical due diligence analysis. In the case of wind farms, this kind of analysis consists of the wind resource assessment, an environmental and market audit (if the project is encumbered with the market risk), as well as the finance model audit, security audit and legal audit. When structuring the transactions run in a "project finance" formula, the risks occurring at the stage of construction and in the operational phase of the project are divided among the investor, the general constructor and financial institutions. When the banks analyse the project in the field of energy generation, they estimate the risk of the project, taking many factors into consideration, including:

- the structure of energy reception contracts, the adequacy of the period for which the contract is concluded and the financing period, the energy recipient's standing and the scale of merchant risk, which encumbers the project,
- the provisions of the fuel supplies contract
- the main provisions of EPC contract, including the level of the offered executive guarantees and contractual penalties, as well as the main contractor's standing, his/ her financial ability and experience in accomplishing similar enterprises.
- the entity's energy generation technology and the experience in its application to similar projects in the world,

- the environmental aspects connected with the accomplishment of the investment, its influence on the environment and the local community, including the accordance of the project with the equator principles,
- the regulatory aspects.

The financing in a "project finance" formula can be obtained without recourse or with a limited recourse towards the investor, including in the form of an obligation to cover the unexpected construction costs, fuel supplies and/or energy reception contracts or as a different kind of support for the period of construction. Depending on the performed analysis of sensitivity and the extent to which the project sells energy on the market rules, the level of equity is determined, and usually it varies between 20% and 40% of the fixed investment costs. The equity of the SPV accomplishing the investment, the pledge on the company's stocks or shares and the agreements on the transmission of the most important contracts can be a collateral in a "project finance" transaction. The financial institutions also enter into the direct agreements with the most important parties to the project, which enables them to obtain the rights of SPV and continue the project in the event of their breach. The financial documentation of "project finance" projects is much more rigorous and extensive than in the case of corporate financing. Moreover, contrary to the corporate credits, in which the financial indicators are based on balance and the company's profit and loss account, in the project finance one applies the indicators referring to the cash flow generated by the project, such as the designed and historical, minimum and medium debt coverage indicators. Thus, the crucial element of "project finance" financing is the preparation of the financial model of the planned investment. Today the difficulties concerning the construction of such models for the power industry result, inter alia, from:

- the uncertainty of the division of the free  $\mathrm{CO}_{\rm 2}$  emission allowances
- $\bullet$  the unpredictability of the prices of the  $\mathrm{CO}_{_{\rm 2}}$  emission allowances on a free market



### Graph 14. Exemplary structure of the project conducted in a "project finance" formula in the sector of energy generation

- the expected introduction of the duty to apply a currently expensive CCS technology (capturing and storing of the CO<sub>2</sub>) in all the carbon installations, meaning the increasing cost of the investment itself and - in addition - the lesser energy effectiveness of the new blocks in comparison to the level of those from the previous generation,
- instability of the legal regulations on the power industry,
- uncertainty of the URE's activity, the effect of which is a growing unpredictability of the prices.

The financing periods for tranches in the commercial banks, when the "project finance" method is applied, usually amount to 8-15 years, but the payment of the financing is, in the majority of such cases, adjusted to the cash flow generated by the project. The banks are prepared to finance the project in the "project finance" structure. There are also many competent consulting companies on the market. Let us hope that within the next few years the regulations will change in such a way that the investors will not have any problem to convince the banks of the necessity of financing the new projects supported by trustworthy financial models.

### 4.1.3 Regulated market

The emission of the debt securities is a way to finance the entities from the power industry sector, which supplements the bank credit. It is also an effective, flexible, easy and safe way to obtain the financial means from the capital market.

The bonds issued by virtue of the Bond Act from 19th June 1995 are the most frequently used ones by the Polish enterprises. This choice that most corporate entities make is strongly fixed in the legal regulations. The bond issuer states that he/she is a debtor of the covenanted and he/she is obliged to accomplish a payment or some other benefit. The rules of issue, sale, purchase and fulfillment of these benefits, as well as the investors' rights, are specified in the issuing conditions. Depending on the demands, the issue can be run once or many times in the form of the so-called programme. It defines the basic rules of debt papers' issue if their joint nominal value does not exceed the sum fixed by the bond issuer and the programme manager. The programme of the debt papers issue can be organised for one or several issuers from the given capital group.

The debt papers may finance both the operating expenses and the investment ones of the issuer. The maturity terms of the bonds are adapted to the current issuer's needs, but the shortest period is 14 days and the longest one (among all those on the market) – more than 10 years. The decisions on the frequency of starting the issue, the sum of the issue and its maturity date are made on the spot by the issuer in content with the offering party.

The corporate bonds issued on the Polish market are - in most part - unsecured. Contrary to the bank financing, the catalogue of credit clauses here is also very limited. It gives the issuer more flexibility in running an operational and investment activity.

In the case of the issue offered to the market investors, the debt papers sale is conducted according to the due diligence rule on the offering party's side. In connection with the above mentioned, the success of the issue depends directly on the demand, and the latter results from the issuer's reputation and offered profitability of the debt paper. Among the factors that influence the cost of obtaining financial means on the capital market, one should definitely enlist the credit risk judgment of the issuer, the maturity date and the current market situation (including the supply and the profitability of the Treasury papers and other corporate instruments).

The bond issue makes an attractive capital source mostly for the entities with a strong and stable market position, a high credit rating and good perspective of development. To benefit fully from this way of financing, a relevant issue scale is demanded. In order to assure the success of the issue, the bank may commit itself to take up some share or the full stake at a predetermined price. In Poland such guaranteed bonds make a very large part of the issued corporate bonds and technically they work as the credit, but they are far easier to obtain by the Treasury companies, due to the procedural matters.

What results from the above analysis, is that the power industry companies fulfill all the conditions to obtain financing from the issue of debt papers. Especially as they can benefit from the exceptional advantages of this kind of activity financing. These are:

- the diversity of the financing sources (including the possibility of obtaining it from outside the banking sector),
- the possibility of liberating some of the possessed bank limits and collateral required by the banks,
- the possibility of financing in a long run without security and in a more flexible structure in the field of credit clauses,
- the possibility of choosing between the ways in which the credit may be paid (once, on the day when the debt papers are bought, or by means of amortized payment, during the period when the debt papers can be bought),
- the shaping of the financial debt profile in the company's balance,
- the limited information requirements in the case of nonpublic issues,
- the issuer's prestige resulting from his/her presence on the capital market,
- the exemption of the services in the field of bond issue from the Public Procurement Law. The structure of the companies' debt indicates that, by means of debt papers issue, the enterprises at the moment obtain only 10% of their debt. Te main source of financing the economic entities are the bank credits. On 31st December 2010 the joint value of the non-Treasury debt papers market amounted to PLN 54 billion<sup>2</sup>, the 32.6% of which were the medium- and long-term corporate bonds.

The Polish companies-issuers finance themselves mainly by the bond issue on the local market. Currently only a small number of enterprises decide on issuing bonds on the European market, mostly due to the expected scale. In order to obtain the positive effect of economic expectation, the minimum value of bond issue on the European market should amount to EUR 200 billion (EUR 500 billion would be the best option), and the issue should have the rating of one of the leading rating agencies (Moody's, S&P or Fitch). The advantage of the Euro-bonds are also the long maturity periods accessible on the European market, in the case of the power industry entities, it may as well be 5-10 years.

<sup>2</sup> Apart from the issuing of infrastructure bonds of BGK (the bonds of The National Road Fund).

To sum up, the debt papers may be successfully used for the financing of the entities from the energy sector (both by the bond issue on the local and European markets), because:

- the power industry is stable and crucial for the economy's functioning,
- the entities from this sector have a high credit rating,
- the scale of the financing and the time of financing are adequate to the investors' expectations,
- the main domestic energy companies have gone public and this makes the bond issue buyer equal to the shareholder in terms of the access to the current and temporary reports,
- the institutional investors being the issuer-public company's shareholders, are often interested also in the debt papers of this entity.

For a couple of years the companies from the Polish power industry sector have been using the bonds to finance their needs. Currently, the entities from PGE, Tauron and Energa Groups are among the bond issuers.

## 4.1.4 Other outer financing sources

The commercial banks can also be a source of financing for very large infrastructure projects, but only to some extent. They are limited both legally and internally on the risk of a single project. In such case the companies obtain the financing from the international financial institutions, like European Investment Bank, European Bank for Reconstruction and Development and Nordic Investment Bank.

The financing from EIB and NIB, apart from the lower costs, is characterised by a longer financing period then the one offered by commercial banks. Thus the share of these institutions in financing extends the average investment financing period, without raising the costs of this extension to a significant extent.

- EIB runs its activity mainly in the European Union. Apart from that, it is involved in the projects in other parts of the world on a limited scale. According to the information available in 2010, EIB signed the contracts on financing worth EUR 71.6 billion including EUR 14.6 billion in the power industry sector. Currently EIB has 265 approved projects (47 concern the power industry), the financing of which is announced for the next couple of years. The following 231 projects (47 concern the power industry) are being evaluated, including: building of a new biomass boiler by Południowy Koncern Energetyczny SA (the value of the project: EUR 108 million, predicted involvement of EIB - EUR 53 million), construction of the heat and power plant on the south of Poland (the value of the project: EUR 143 million, predicted EIB credit - EUR 72.3 million) and construction of the gas steam block in Stalowa Wola power plant (the value of the project: EUR 400 million, predicted EIB involvement - EUR 140 million).
- EBRD runs its activity in 29 countries of Central and Eastern Europe and Asia. In 2009 this institution invested EUR 7.9 billion in different projects. In May 2010 the involvement of EBRD in Poland amounted to EUR 1.6 billion. In 2010 EBRD agreed to grant a credit of PLN 800 million (including EUR 400 millions from the own means of EBRD) to Energa SA, with the purpose of financing the development of a distribution grid. In the same year ERBD also bought 25% of shares in Iberdrola Renewables Polska Sp. z o.o., a company dealing with wind power industry. The cost of the shares was EUR 75 million. At the moment ERBD is analysing the possibility of granting a refinancing credit to Elektrownia Pątnów II. It would amount to EUR 80 million.
- NIB invests in the countries of the European Union and in the emerging markets. At the end of 2009 it had EUR 13.8 billion in the granted credits, mostly for the projects in the field of environmental protection. In 2010 NIB gave Energa SA a credit of PLN 200 million (around EUR 50 million) for the financing of modernisation and expansion of the distribution grid for the next 12 years.

Another source of financing are the export credit agencies, which support the export of their own countries by granting credits to the foreign entities acquiring the goods produced in those countries. A Polish energy enterprise may obtain a credit from this kind of agency, if it imports the equipment from the country from outside the European Union (the single market within the borders of EU eliminates the question of export among its member countries), in which an export credit agency works (such as South Korea, where Korea Eximbank operates). These agencies are usually able to accept a higher risk then the commercial banks, meaning that they enlarge the general volume available for the debt financing enterprises.

What is considered the most beneficial of all the sources of financing (taking the cost into consideration), are the means from the EU funds. They may be invested in renewable sources, but also the investments improving the generation effectiveness and the transmission and distribution effectiveness. However, it should be noticed that the stake of the EU means available for the energy enterprises for the period between 2007 and 2013 is close to its end. Moreover, as a rule these means do not cover 100% of the investment cost. The beneficiaries have to cover some part of it from other sources, including credits. Neither do the means from the EU funds allow financing most of the investments in the area of the generation units on the conventional fuel based load. The energy enterprises belonging to larger groups, such as the international energy concerns (RWE, E.ON, Vattenfall), may count on their investors' support while obtaining the outer debt capital. This support can have the form of an endorsement of the credit payment or obtaining the credit directly by the mother company and then granting a loan to the daughter company. It is important that being a part of a big, stable and debt-free energy group is well perceived by the financial institutions and can influence the company's credit rating.

#### 4.2 Financing with the equity capital

When deciding on the capital structure, including the scale of the equity employed, the energy companies should reflect on the cost of the particular sources of financing. The capital cost, meaning the rate of return expected by the owner, is highly dependent on the risk that is taken. Two components of capital cost can be distinguished: risk free rate (as a rule it is specified on the level of the interest rate of the long-term Treasury bonds) and a risk prize - for the risk involved in employing the means in the given investment. In a practical sense risk free rate defines the minimum. Below that figure it is impossible to obtain capital (apart from the granted resources and the specific guarantees elevating the rating). The higher the investment risk, the more this minimum cost grows, because in the acceptable risk area only the sufficiently high risk prize can encourage the investor to involve him/herself in the given project.

The risk connected with the equity is far higher than in the case of debt, as the creditor has the specified gain granted in the contract (in the shape of the credit interest), as well as the return of the whole capital in a determined time. In the event of his/her bankruptcy his/her demands are satisfied as the first ones (before the owners'). That is why the cost of equity is higher than the cost of debt, but equity can also finance far riskier projects.

The cost of capital and the project risk are undoubtedly the crucial elements affecting the choice of the source of financing. However, one cannot forget such matters as:

-maximising the profitability of the equity, meaning the market value of the enterprise, securing the financial liquidity, as well as the financial credibility and safety for the capital suppliers (owners and creditors). What is also important is the influence of a capital structure on the ownership conditions, including the possible dangers for the current owners, freedom of making decisions and the scope of the decisions made or the risk of rise of the conflict of interests between the owners and the creditors. An additional equity can be obtained from the existing shareholders or the new investors, including via the stock market (by the issue of new shares). The accessibility of the financial means from the existing shareholders is strictly dependent on their financial capacities and investment priorities. Obtaining the capital from the stock market is easier and cheaper, when the shares of a certain enterprise are already on the market, then in the case of a company which does not function in the public trade.

On the Polish stock market the shares of three Polish energy groups are publicly traded (PGE, Tauron, Enea),

as well as one significant foreign entity (CEZ) and a number of smaller energy enterprises. Due to the above, the investors' interest in the energy companies' offer in the future may be smaller than in the period between 2008 and 2010, when Enea, PGE and Tauron entered the stock market. When reflecting on preparing an IPO, the energy enterprises should also think of the influence it is going to have on the present shareholders. The owners willing to keep the control over a company may be a factor diminishing the level of the capital possible to obtain from the stock market.

On the ownership level, the power industry in Europe is dominated by the strategic investors. That is why the stock markets are most frequently used for the ownership changes and not as a means of active finance obtaining. It is extremely evident in Poland. It does not exclude using the public trading for finance obtaining, but it enforces to take the shareholders' opinion into consideration.



### 5. Summary

Information presented in this report reveal that in Poland a relatively big energy market exists and it has a visible potential to grow. The entities which operate on this market are able to incur debts in banks, basing on their own balances. The financial institutions are favourably disposed towards the power industry and they offer different possibilities of financing the investments. The necessity of building new generation powers is a logical consequence of the technological life-span of the currently exploited energy blocks and the growing demand for energy. Thus, we have an absorptive market, a rational investment need, a huge investment potential of the companies, accessibility of the financial resources and... still not enough of investments. Why is it so?

The power industry sector in Poland, perceived by an outside observer, is composed of two seemingly contradictory pictures. On one hand, an "action movie": all the time the new EU regulations generate rapid changes in the legal surroundings and create new impulses, meant to stimulate the investing behaviour within the sector. On the other hand, "Cut!": the magnitude of still unsatisfied investment needs. However, these two pictures juxtaposed make a coherent vision of the sector, in which the investment torpor is, to a high extent, an effect of dynamic changes in the field of regulation.

Such a rapid change is a true revolution in the power industry. It is enough to recall the most important events changing the shape of the sector in the last few years: consolidation, the progress in privatisation, changes in legal regulations, the liquidation of KDT, the TPA's coming into force, the transmission, distribution and trade division from the energy generation, declarations on the growing share of the renewable energy sources among the generation sources, the formalised need of limiting the  $CO_2$ emission, the pressure on introducing the CCS technology or the statutory forcing of the energy trade via PLPX. In this report we do not provide any answers on the rightness of these changes and we do not question their relevance.

However, what we do notice is that in the sector, in which the investment horizon is measured in decades, an assurance of legal regulation' stability is needed; that the support, preference and restriction systems should be transparent and long-term. It seems that it is enough to meet this demand, so that the investors could estimate appropriately the economic rationality of the projects within the power industry sector. This is the main condition, under which the long-awaited investments in this sector could finally start. It seems that before it happens, we can count of big investments only in the companies, which are still controlled by the State. This is the owner, who makes investment decisions not only because of the rate of return of capital employed, but also it is naturally obliged to care for the interest of the whole country.

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