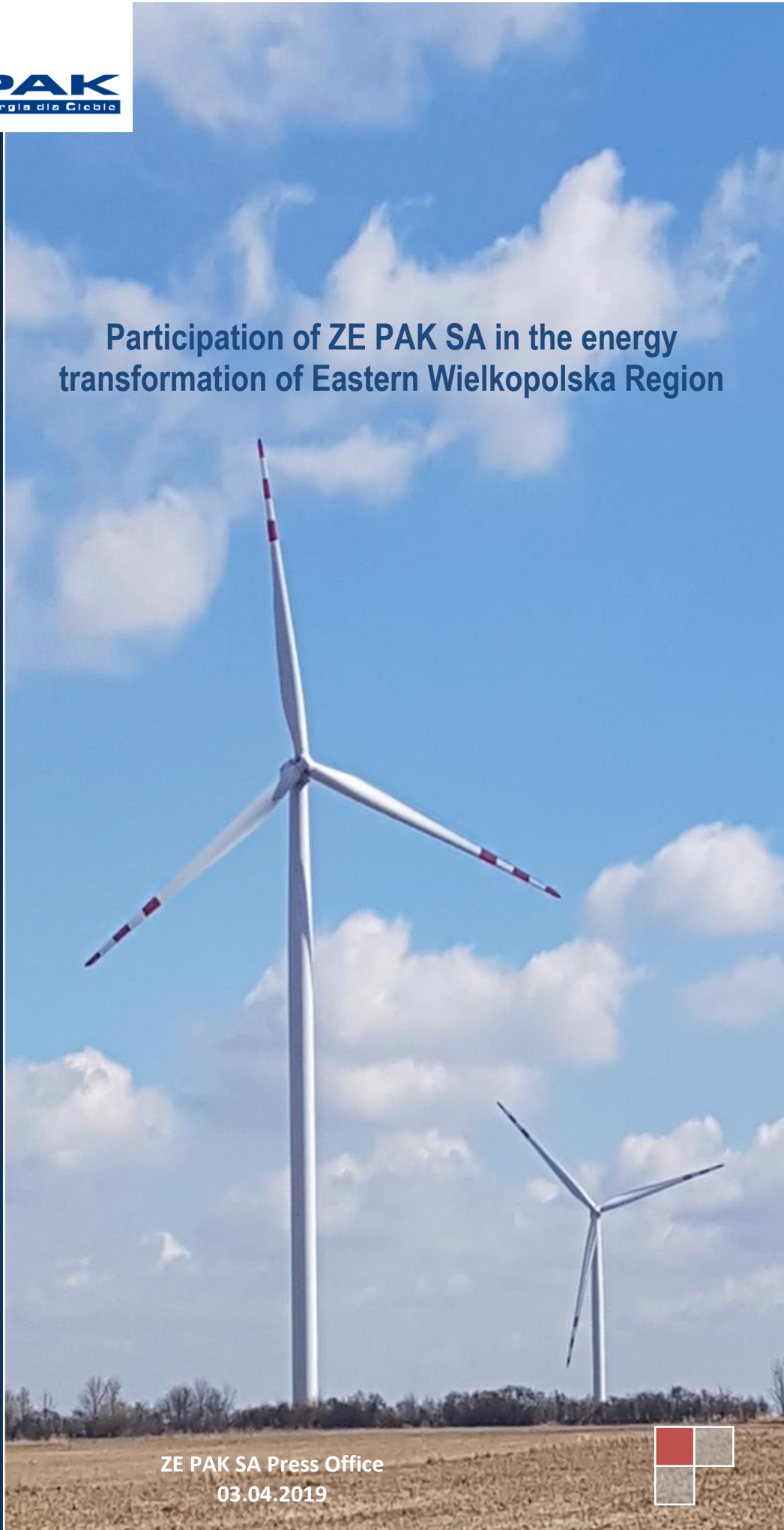


## Participation of ZE PAK SA in the energy transformation of Eastern Wielkopolska Region



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### Information about ZE PAK SA and ZE PAK Capital Group

**Zespół Elektrowni Pątnów-Adamów-Konin SA (ZE PAK SA)** is the parent company in ZE PAK SA Capital Group, one of the largest business entities in Eastern Wielkopolska. The main activity of ZE PAK SA Group is lignite mining, generation and sale of electricity and heat. Since October 2012, ZE PAK SA is a private company listed on the Warsaw Stock Exchange. The production assets of ZE PAK SA Capital Group include three lignite-fired power plants located in the central part of Poland in Wielkopolskie voivodship. These are: Pątnów I, Pątnów II and Konin. Total installed capacity of the production facilities is 1896 MW. The company generates energy from conventional sources and by burning biomass.

**ZE PAK SA Capital Group (Group)** is a vertically integrated energy company (fuel and energy chain), which apart from the aforementioned activity also includes the extraction of lignite from PAK KWB Konin SA and PAK KWB Adamów SA.

### Participation of ZE PAK SA in the energy transformation of Eastern Wielkopolska Region on the Coal Platform, new EC initiative

#### European Commission Statement dated 17 December 2017

” The EU's commitment to switch to clean energy is irreversible and is not negotiable. In this process of transitioning from a fossil fuel-based economy to a more sustainable economy, none of the regions should be left alone.

The new platform launched today is to facilitate the creation of projects and long-term strategies for mining regions. These projects and strategies are designed to stimulate the transformation process and respond to environmental and social challenges. Thanks to it, interested parties at the EU, national, regional and local level, involved in the transformation process, will be able to develop different forms of partnership and learn from each other. The platform's activities will initially focus on mining regions, and in the future will also include regions with high carbon dioxide emissions. It is to support the transition to clean energy and put more emphasis on social justice, structural change, new skills and financial support of the real economy.”

The European Commission is urging all the countries of the Community to conduct a policy that will encourage companies to introduce even stricter standards than those in force with a view to protecting the environment. It is assumed that the state will create an appropriate system of incentives to increase investments in environmental protection or will conduct a policy of support in

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the process of limiting or stopping production processes due to the good of the natural environment. This form of state aid is considered as a stimulus, without which it would not be possible to independently make decisions that have a significant impact on the operating costs of the entity, taking into account that the entity must analyse the costs of operating in a competitive market. Aid for entrepreneurs should be justified as an incentive to take these decisions. It can also be used to reduce the relatively high financial burden on some companies so as to enable a more stringent environmental policy to be pursued.

The socio-political objectives of the European Union aimed at areas where miners of fossil raw materials are located and energy producers based on these fuels should take into account all changes that will occur as a result of transformation of these regions wanting to induce them to new ways of production with a view to preserving the natural environment, its improvement and the prevention of irreversible climate change in the future as a result of high emissions of greenhouse gases and other pollutants. The political context is designed to make people aware of a specific climate policy adopted by EU countries, sometimes incompatible with regional policy, in exchange for specific forced actions directed to coal regions. By adopting a specific policy, EU countries have decided, under solidarity projects, e.g. the Cohesion Fund, to compensate for countries that are struggling with the problem of high-emission and energy-intensive economies. We should take advantage of the opportunity which is currently opening up in the Union for mining regions in the transition period and making a leap into innovative solutions.

In connection with this, ZE PAK SA together with representatives of Eastern Wielkopolska Region made efforts to take advantage of the opportunity that the EC initiative in the scope of creating the Coal Platform in transition brings to the region. Simultaneously, there was created the concept of "Just Transition" to reflect the nature of changes in coal regions. The voivodship self-government in cooperation with the Management Board of ZE PAK SA developed an agreement, which is the first step to wider cooperation in the transformation of the Eastern Wielkopolska Region. The agreement is also to make people aware of the need to use support instruments in the area of aid for the entire Region, creating opportunities for the development of energy from renewable energy sources, development of new generation technologies, investments in new economic areas, moving to a low or zero-emission economy, including development of social programs.

The current situation on the energy market prompts ZE PAK SA to look for new, low-emission energy sources that are an alternative to coal. In order to use the assets in its resources, it developed concepts, rules and schedule of investments, which, with the support of mining regions within the

Coal Platform, will give impetus to the development of the ZE PAK Group in new areas of activity for the coming years. Among the considered projects, the following should be mentioned:

Construction of solar farms on reclaimed areas of the Group, Adaptation of a part of the coal installation for biomass burning, Construction of a heat storage for the heating needs of Konin City, Construction of wind farms on reclaimed areas of the Group, Construction of an energy storage system at the site of ZE PAK for the needs of RES, Construction of a logistics centre with development of solar panels on the roofs, Construction of infrastructure for the production, storage and distribution of hydrogen, Production of photovoltaic panels, production of assembly elements and assembly of photovoltaic installations

The above-mentioned investments are at various stages in the process of concept development, however their success may contribute to the implementation of the idea of a just transformation of the Region of Eastern Wielkopolska, taking into account the principles of sustainable development and respect for the social side. We want to develop and restructure ZE PAK SA Capital Group so that the intended investments in the future have a positive impact on the development of ZE PAK SA Group and on the development of the region in which it is located.



### Description of projects - investments

#### 1. Construction of solar farms on reclaimed areas of the Group

The project assumes the construction of solar farms on reclaimed areas created after the completion of lignite mining processes (opencast mines). The implementation of the project has been divided into three stages resulting from the gradual completion of the process of land reclamation for the needs of the construction of photovoltaic farms. The first stage covering the years 2019 - 2022 provides for the commissioning of solar farms on reclaimed and being reclaimed areas in three locations with a total installed capacity of 250 MWp. The second stage covers the years 2023 -2024 and assumes the further development of solar farms by 150 MWp, and in the third stage covering the years 2025-2026 another 150 MWp. The total installed capacity of all farms is planned at 550 MWp. Photovoltaic farms will generate electricity necessary for the region's and country's energy security (the central location of the ZE PAK Group's assets), while eliminating environmentally negative greenhouse gas emissions, replacing energy generated from the combustion of mine sources.

#### 2. Adaptation of a part of the coal installation for biomass burning

The subject of the project is the production of energy and provision of a reserve source of heat supply to the city of Konin from the reconstructed coal-fired boiler, dedicated to the exclusive combustion of biomass. This boiler will cooperate with TG5 turbine or TG4 turbine. It is assumed that due to the steam parameters, K7 (biomass) boiler will work in the base with a condensing TG5 turbine for the production of electricity. The implementation of the project will have a positive impact on the socio-economic development of the Region and the Country. The main benefit will be to provide the economy with a new power generation unit and thermal energy operating in an environmentally friendly manner. The demand of

enterprises and households for energy is constantly growing, and at the same time there is a need to eliminate the negative impact of the energy industry on the environment.

### **3. Construction of a thermal energy storage system for the heating needs of the City of Konin**

The basic task of the planned system is to equalise the load of the heat source during the changeable demand for thermal energy. Its task is to secure heat supply for the city of Konin and the surrounding area, while ensuring a high standard of supply. The aim of the investment in the thermal energy storage system will be to optimize the electricity production conditions as well as cogenerated heat in such a way so it could be possible to use the stored thermal energy in a situation when the demand for it is the greatest and when the production of electricity is the most expensive. A heat storage system is comprised of a tank in which thermal energy is accumulated in the form of hot water in its upper part. During charging, the amount of hot water increases while the amount of cold water in the tank reduces. When discharging, the process is reversed. The thermal energy storage system will also be a “safety buffer” for the city of Konin throughout the whole year, especially in the event of a temporary failure of heat sources.

### **4. Construction of wind farms on reclaimed areas of the Group**

The project involves the construction of 20 windmills with a capacity of 3.9 MW each. The amount of energy produced by one 3.9 MW generator gives approximately 13.5 GWh per year. The windmills will be deployed in two locations, initially there were selected locations in Przykona and Kleczew communes. For each tower, an infrastructure is necessary, i.e. a technical road and a place for the construction of a transformer station and a technical yard. Current technology allows building high towers on deformed land (reclaimed land) without increasing investment costs. The power of both farms will be 78 MW of connection power, producing approximately 270 GWh per year. Wind farms will generate electricity necessary for the region's and country's energy security (the central location of the ZE PAK Group's assets), while eliminating environmentally negative greenhouse gas emissions, replacing energy generated from the combustion of fossil fuels.

### **5. Construction of an energy storage system at the site of ZE PAK for the needs of RES**

The production of energy from renewable sources, due to its dependence on weather factors, does not guarantee a uniform level of its supply at any time of the day, as it is in the case of conventional energy generation. This means that in periods when renewable energy sources produce energy, there may be low demand for it, and at high demand, on the other

hand, RES production may be limited due to unfavourable production conditions. This affects the security of the country's power system. The solution to the problem of adverse phenomena accompanying the production of energy from renewable sources may be energy storage systems improving the balance between supply and demand for energy from RES. Energy storage systems can also affect generation control in order to maintain network stability and security of supply. This means that with the development of renewable energy sources, a careful distribution of energy storage is necessary for the stability of the energy system. The rapid development of RES, on the one hand, significantly affects decarbonisation, however on the other hand, forces the search for solutions that will support this process while maintaining a high level of system security, which should be included in the challenges facing the power sector.

**6. Construction of a logistics centre along with the execution of photovoltaic farms on the roofs**

The region transformation process should also include areas of the economy that are not directly related to energy production but should lead to the economic development of the region using existing opportunities. The project pursuing the assumed development strategy of the Eastern Wielkopolska Region is the construction of a logistics centre. The analysis of potential possibilities being conducted indicates that with the cooperation of the local and voivodship governments, taking advantage of the location of the areas near the A2 motorway and access roads as well as the infrastructure of the liquidated Adamów mine, we want to use this area to build such a centre. The investment is to be located on the premises of the closed Adamów mine in Warenka, on plots owned by ZE PAK Group. The location of the logistics centre in Warenka has been dictated by the availability of land and location near major motorways (A1 and A2) and the airport in Łódź.

The distance of the logistics centre to the entrance to the A2 motorway is only approx. 22 km, the distance to the A1 motorway entrance is approx. 90 km, the distance from the airport in Łódź, which also provides cargo services, is approx. 85 km. Ultimately, the project assumes the construction of a hall with an area of 25 thousand m<sup>2</sup>.

**7. Construction of infrastructure for the production, storage and distribution of hydrogen**

The project aims to build a hydrogen production plant using the method of water decomposition in electrolytic cells working in PEM proton technology for the needs of zero-emission car transport. At present, the lack of hydrogen production and distribution

networks is a barrier to the implementation and development of zero-emission transport in the city of Konin and other cities. A plant with an electrical capacity of 45 MW would consist of a dozen of sets of electrolysers with a total capacity of approximately 9,000 Nm<sup>3</sup> / h producing 20 Mg of hydrogen per day and would be supplied with electricity generated by a 50 MW RES block. The project also provides for the construction of a hydrogen warehouse with a capacity for its daily production and stations enabling the charging of electric cars and buses equipped with fuel cells, and hydrogen charging stations for cars - tanks for its distribution.

The appearance of a hydrogen plant in the region will contribute effectively to the implementation and development of zero-emission transport in Konin and other cities. It will enable the creation of a network of hydrogen charging stations in Poland, which as part of the European HIT-2-Corridors project should take an active part in the network of hydrogen filling stations developed in Europe. Combined with the launched Energia Plus program, co-financing local governments with the purchase of collective transport in low or zero emissions, increases the chances for its implementation and may be the basis for a permanent change in Konin region in terms of reducing emissions and improving air quality in the city and will reduce overall pollution in the area of the city.

#### **8. Production of photovoltaic panels, production of assembly elements and assembly of photovoltaic installations**

The planned investment will be located in the town of Warenka on the area previously used by PAK KWB Adamów. The project assumes the construction of production halls with an area of 3 thousand square meters and launching there an assembly line for the production of photovoltaic panels and ready sets of photovoltaic installations. The main intention is to produce and sell with assembly for both prosumer customers and for companies wanting to start renewable energy production for their own needs and for sale. It was initially assumed that at the moment of launch, the production line should produce annual photovoltaic panels allowing the construction of installations with a nominal power of up to 80 MWp, with the possibility of further expansion in case of demand.

Launching the production of photovoltaic panels / installations will contribute to the improvement of the situation on the labour market and consequently will create new jobs, including highly specialized ones.

**Social and environmental aspects arising from the implementation of the proposed projects under the Region's Energy Transformation:**



- The implementation of projects will have a significant impact on socio-economic changes in Konin region
- The main postulate of a just transformation of coal regions will be implemented
- Taxes on ongoing and implemented investments will feed budgets of municipalities and cities in which they will be created
- New jobs will be created in the renewable energy sector and in other sectors
- The demand for new highly specialized competences in the Region will arise, the training market will develop
- Development of new technologies and innovative solutions in the field of energy production and storage from RES
- The implementation of all projects will significantly affect climate change by reducing CO<sub>2</sub> emissions by about 1.4 million tons and reducing emissions of SO<sub>2</sub>, NO<sub>x</sub> and dust
- It will be possible to start zero-emission transport - especially public transport, by setting up a hydrogen refuelling station

**President of ZE PAK SA Management Board**

***Marcin Ginel***