Polish toll for the German electricity?

Not only climate change and outdated technology, but also spillovers from German grid overburden Polish energy transmission networks - explain researchers from the Laboratory of Energy Conversion (LEC) in Zurich. These are essentially uncontrollable spills generated by German renewable energy sources. Researchers from the Swiss Institute emphasize that costs for the Polish side are calculated in the hundreds of thousands of zlotys.

According to the Swiss Laboratory, in 2013 the average energy flows from Germany to Poland ranged up to 728 MW. For comparison, from Poland to Germany in the same year, only 174 MW.[1]

The scientists from the LEC**,** Patrick Eser, Antriksh Singh, Ndaona Chokani, and Reza S. Abhari, explain in their paper that Germany and also Austria use the Polish transmission grid during the unscheduled electricity flows, without bearing any costs in favour of Poland. This issue was brought during the Warsaw Congress "New Industry". Wladyslaw Mielczarski from the Energy Institute Technical University of Lodz insisted that we should be treated by Germany as a partner and not a vassal of the energy market.[2]

A lot has been said about the difficult situation in the Polish power industry during the summer heat wave. In August record temperatures, drought, and much higher than usual, power consumption, resulted in Poland for several days of restrictions in the supply of electricity for industrial customers. Although the situation came back to normal after a few days, the losses were estimated in billions of zlotys.[3] The temporary power shortages started a discussion in about black scenarios and how high is the risk of a real blackout.

Researchers from the Laboratory of Energy Conversion in Zurich show that a large scale of uncontrolled spillovers derive from renewable energy sources in Germany, which are responsible for about 5% - 8% of the network load in Poland.[4] At the current stage of development and implementation of technology, spillovers can not be stored efficiently. Unused electricity flows to Polish energy networks, causing them to strain and generating additional costs associated with network maintenance. Then the electricity returns to Germany.[5] Only in 2013, as researchers from the Swiss Federal Institute of Technology estimate, total fees of 47 million euros, nearly 200 million zloty were imposed, on Polish consumers due to additional

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[1] "High resolution simulations of increased renewable penetration on Central European transmission grid" Singh, A. ; Chokani, N. ; Abhari, R.S.

[2] http://wyborcza.biz/biznes/1,100896,19051459,niemcy-chuliganem-energetycznym-europywykorzystuja-polske.html

[3] http://www.portalspozywczy.pl/technologie/wiadomosci/miliardowe-straty-producentow-zywnosci-zpowodu-ograniczen-w-dostawach-pradu,117953.html

[4] Odnawialna energia dla Polski: "Holistyczna ocena generacji i transmisji oraz bezpieczeństwa dostaw sprawiedliwości ekonomicznej", Reza S. Abhari Laboratorium Konwersji Energii, ETH Zurich

[5] "High Resolution Simulations of Increased Renewable Penetration on Central European Transmission Grid", Patrick Eser, Antriksh Singh, Ndaona Chokani, and Reza S. Abhari

charges for transmission services. Calculations of the Laboratory show that around one-seventh of the cost of current losses caused by spillovers. [6]

The contribution of RES in the energy market will increase. Therefore, explain the scientists, Poland should strive for the best the development of transmission networks, also for the sake of the stability of conventional energy sources. Without the modernization of the network, they will become less and less efficient and more aggravating for the natural environment.[7] Currently in Poland the share of RES in the energy sector is about 11 percent and, according to the European Union policy, develops all the time.[8] The German market of "green energy" has been very dynamic for years. According to the data of German Association of Energy and Water over 26% of electricity production in Germany last year came from RES.[9] According to a study of LEC, in 2020 years to Poland will flow from the West approximately 10% percent more electricity than today. Therefore Polish grid, often not modernized for decades, will struggle with even greater burden that will increase costs. Scientists also predict increase in the load on the route Poland - Germany: from Poland 12% more of electricity will flow to Germany than currently.[10]

During the discussion about the future of RES in Poland, there are even hearing calls that fast development of this branch will violate the balance of the transmission grid. In August, during the heat and restrictions in electricity production conventional energy company representatives told a negligible share alternative energy sources in covering the losses and the lack of a coherent, long-term plan for the usage of photovoltaic or wind farms in the Polish energy sector. But it should be emphasized that in Poland this branch of power in its infancy, and we should still wait for the real contribution of RES to the Polish energy market.

In the article "High Resolution simulations increased use of the system transmission of electricity from renewable energy sources in Europe Central," the authors claim that without investment in upgrading transmission lines, our region will not be able to further develop the EU market for renewable energy.

Investment is also conventional energy sources will become increasingly less efficient and more aggravating for the environment. Therefore scientists from the LEC, who study the situation in European energy sector, emphasize the importance of sustainable and lasting spread development transmission networks, taking into account their development of renewable energy sources.

Development of the presented results is possible because the Federal

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[6] LEC

[7] "High Resolution Simulations of Increased Renewable Penetration on Central European Transmission Grid", Patrick Eser, Antriksh Singh, Ndaona Chokani, and Reza S. Abhari

[8] Eur"Observ"ER

[9] https://www.bdew.de/internet.nsf/id/20150306-pi-erneuerbare-energien-erzeugen-mehr-strom-de

[10] "High Resolution Simulations of Increased Renewable Penetration on Central European TransmissionGrid", Patrick Eser, Antriksh Singh, Ndaona Chokani, and Reza S. Abhari

Institute of Technology in Zurich since 2009 developed the integrated tool Energy Systems Analysis, called EnerPol. It is used to evaluate the entire cycle functioning infrastructure generating and transmitting electricity. It simultaneously evaluates more than 200 variables, like anthropological, geographical, climatic, financial factors or legal regulations. Analysing areas of Western and Central Europe, including the Polish territory, carried out with great accuracy in a minimal spatial resolution of 30 to 30 meters and 15 minute time resolution. According to the researchers, who analyzed the situation in our region, Poland should not only focus on the development of its energy sector and networks. Poland should also court on how most dynamic network development transmission of our western neighbour, especially those linking Northern and Southern Germany. So that uncontrolled until now flows not been a burden for Polish grid and for the Polish consumers. An opportunity for sustainable development can be the Energy Union, advocated by the current European Council President Donald Tusk. The Unions aim, in addition to the development of green energy, is the energy distribution within the Community, based on solidarity and security.

Focusing on the topic of spillovers from Renewable Sources of Energy: Scientists constantly working to improve methods of energy storage.[11] Researchers from the Institute Energy Conversion in Zurich have suggested that one solution would be expansion of Polands network of pumping stations pumped storage, based on the principle of a high-capacity battery. Their use is only possible in conjunction with power plants, which are unable to adjust swiftly to the amount of electricity produced for current demand. Switzerland uses such solutions for the years, by accumulating a spillover of electricity flowing to the country from France. Later it sold much more expensive to Italy.

Before Poles even start to consider whether or not to impose on "German energy", flowing through our network, a tax similar to the toll that Berlin imposed on lorries from abroad, it is worth working on how best using those spillovers and most sustainable development of cross-border transmission networks . Moreover, the current situation shows that Polish network despite the necessity of modernization, has the possibility of adopting a significant amount of electricity from RES.

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11 Integrating Renewable Electricity on the Grid . A Report by the APS Panel on Public Affairs