

Law and ambition in Poland's energy transition



ClientEarth
Prawnicy dla Ziemi

Warsaw, December 2018

Publisher: ClientEarth Poland ul. Żurawia 45, 00-680 Warszawa

Suggested citation: Kukuła, W. (2018), Law and ambition in Poland's energy transition, ClientEarth Prawnicy dla Ziemi Foundation, Warsaw

Author: Wojciech Kukuła

Edited by: Ellen Baker

Graphic design: Sylwia Urbańska

Cover picture: Bartek Banaszak

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ISBN: 978-83-953040-0-2

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INTRODUCTION

Poland's energy sector is attracting major interest in Europe. By and large, it is seen as a laggard compared to other EU Member States with regard to the energy transition - and the data presented in this report seems to confirm such conclusions. The Polish economy is still almost exclusively dependent on fossil and solid fuels, mostly coal, but also oil, gas and biomass, while alternative resources count for only a negligible portion of the country's total energy supply¹.

The ratios are similar in most other Member States, but Poland's dependency on coal (counting both hard coal and lignite) is unprecedented in the EU. Improvements in terms of the country's carbon intensity are mainly thanks to broader economic transformation after the fall of communism and energy-related CO₂ emissions have remained at a steady level for the past 20 years (in spite of enormous economic growth). However, we think that Poland's present, very early stage of energy transition should also be seen as an opportunity and the country may have the biggest potential to improve in the EU.

The main barrier to progress is regulatory issues. Crucial regulations, such as auctions for renewable energy, energy efficiency support scheme in the form of white certificates or derogations for the power sector granted under the EU's Emission Trading Scheme (ETS), have not been working to date. It took years to transpose the 2009 EU climate and energy package into Polish law. Even then, some regulations were not implemented correctly - national renewable energy laws in particular. Decision-makers did not take an ambitious approach, adopting the bare minimum of what was strictly required by EU law. Short-term political benefits won out over a long-term strategy. But it is time for this to change.

We think that the new EU Clean Energy Package and the amended ETS directive will play a crucial role in speeding the energy transition in Poland. Renewable energy sources are constantly getting cheaper and, at the same time, costs of CO₂ emissions are only rising. It is a good moment to pick up the pace. Today, investment in clean technologies is the savviest move.

We have presented the energy sector as it is. But we want to illustrate that the energy transition in Poland is a long way from where it could be. As the global climate summit (COP24) launches in Katowice, the heart of the mining district of Poland, we encourage people to look to the future - and Poland to keep ambition at the heart of energy policy.

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Poland's present, very early stage of energy transition should also be seen as an opportunity and the country may have the biggest potential to improve in the EU

1 Approximately 2% in terms of total primary energy supply.

FROM COAL TO CLEAN IN POLAND

– KEY RECOMMENDATIONS

- **Poland's energy transition must accelerate.** While the country's energy mix has finally started changing and the available data shows that it will become more and more diversified in the coming years, Poland's energy-related GHG emissions have not declined in two decades. All available market predictions indicate that Poland's energy sector will not even come close to the route laid out in the most recent IPCC² Special Report on Global Warming of 1.5°C³, which concludes that CO₂ emissions must reach net zero around 2050 to avert dangerous and irreversible global warming.
- **Imperfect energy strategy is better than no strategy.** Polish authorities must update the country's energy policy on a more regular basis, taking into account the fast-changing technology and supranational regulatory environment. Poland's energy policy should explicitly address climate change.
- **Progressive changes need proper regulations.** Global megatrends, in particular the falling costs of renewable technologies in the power sector, will play an increasingly important role in Poland's energy-related decision-making. But more rapid changes in the energy mix will require a solid and stable national legal framework.
- **Complying with EU climate and energy law is the first step to a faster energy transition.** Timely and proper implementation of new EU climate and energy law (covered by both the Clean Energy Package and the amended framework for GHG allowance trading) is a good place to start. The Polish authorities cannot repeat the mistakes made during the implementation of the 2009 EU climate and energy package.
- **The cheapest available options should be embraced, not banned.** When supporting the development of offshore wind farms at the Baltic Sea, Polish decision-makers cannot forget about onshore wind turbines - a cheaper, equally clean technology. In order to add any significant amount of new onshore wind capacity to the Polish grid, the existing, discriminatory anti-wind energy legislation must be repealed.

² IPCC is a body of the United Nations.

³ <http://www.ipcc.ch/report/sr15/>

Poland's average energy-related GHG emissions have remained flat since the mid-1990s but overall GHG emissions have recently started to grow



GENERAL ENERGY AND CLIMATE OVERVIEW

Poland is in the early stages of energy transition. The public energy debate seems to be more focused on air pollution, while greenhouse gas (GHG) emissions still remain a “taboo” topic.

STOCKTAKE - WHERE DOES POLAND'S CARBON COME FROM?

Poland's average energy-related GHG emissions have remained flat since the mid-1990s⁴ but overall GHG emissions have recently started to grow⁵ and carbon intensity in Poland is among the highest in Europe⁶.

The country's energy mix debate is mostly focused on the power sector, recently the government has started supporting electromobility, while the heating sector – which is also primarily based on coal-fired installations (be it individual stoves or district heating plants) – seems marginalised (despite ~56

4 http://www.kobize.pl/uploads/materialy/materialy_do_pobrania/krajowa_inwentaryzacja_emisji/NIR_2017_POL_May.pdf

5 <http://forum-energii.eu/en/analizy/polska-transformacja-energetyczna>

6 https://www.iea.org/publications/freepublications/publication/Energy_Policies_of_IEA_Countries_Poland_2016_Review.pdf

GWth installed in district heating plants, i.e. despite having one of the largest district heating systems in Europe)⁷.

The fastest growing source of GHG emissions in Poland today is the transport sector⁸. This is similar to other EU Member States - transport is the only area of the EU economy in which GHG emissions are still growing⁹.

IS POLAND ON TRACK TO MEET CLIMATE COMMITMENTS?

According to available modelling, if Poland wants to achieve the Paris Agreement targets (assuming the less ambitious, two-degree scenario)¹⁰, the country must cut overall hard coal consumption by at least 20% by 2030 and 55% by 2050 (as compared to 2015 levels)¹¹. That means that in the power sector, the share of coal would have to be maximum 40% in 2030 and less than 20% in 2050¹². Other analyses, however, indicate that limiting the temperature increase even further, i.e. to 1.5°C – which is consistent with the new IPCC report – means that in OECD member countries, all coal-fired power plants must cease operating by 2030¹³.

For comparison, in 2015 the overall energy mix of Poland (the country's total primary energy supply, across all sectors) was as follows:¹⁴

- coal (including both hard coal and lignite) ~51%¹⁵
- oil ~24%
- gas ~14%
- renewables ~11% (of which ~80% was biomass)

The Polish Power System (PPS) is based on large, centralised and high-emitting coal-fired plants. At present, approximately 70% of capacity in the PPS is still installed in hard coal- and lignite-fired power plants that produce nearly 80% of the country's electricity¹⁶ (for comparison, in 1990 98% of Poland's electricity came from coal)¹⁷. At the end of 2017, nearly 20% of electricity capacity in Poland (approx. 8.5 GW¹⁸) was installed in renewable energy sources (RES), mostly in onshore wind (nearly 6 GW)¹⁹. In 2017 RES produced approximately 14% of Poland's electricity²⁰.

7 [http://orka.sejm.gov.pl/opinie8.nsf/nazwa/489_20170620/\\$file/489_20170620.pdf](http://orka.sejm.gov.pl/opinie8.nsf/nazwa/489_20170620/$file/489_20170620.pdf)

8 https://www.iea.org/publications/freepublications/publication/Energy_Policies_of_IEA_Countries_Poland_2016_Review.pdf

9 <https://www.eea.europa.eu/airs/2017/resource-efficiency-and-low-carbon-economy/transport-ghg-emissions>

10 I.e. assuming that a global temperature will rise this century well below 2 degrees Celsius above pre-industrial levels. See: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

11 <http://lbs.org.pl/publications/transformacja-gornictwa-w-ambitnym-scenariuszu-dekarbonizacji-w-polsce-skutki-dla-rynku-pracy/>

12 Ibidem.

13 https://climateanalytics.org/media/eu_coal_stress_test_report_2017.pdf

14 Source: Statistics Poland via <https://wysokienapiecie.pl/1698-polska-powinna-dyweryfikowac-miks-energetyczny/>

15 This is the second largest share among OECD countries. See: https://www.iea.org/publications/freepublications/publication/Energy_Policies_of_IEA_Countries_Poland_2016_Review.pdf

16 2017 data. See: <https://www.pse.pl/dane-systemowe/funkcjonowanie-rb/raporty-roczne-z-funkcjonowania-kse-za-rok/raporty-za-rok-2017>

17 [https://wysokienapiecie.pl/8002-udzial_wegla_w_produkcyj_energii_elektrycznej_w_polsce/](https://wysokienapiecie.pl/8002-udzial-wegla_w_produkcyj_energii_elektrycznej_w_polsce/)

18 This data does not include prosumer micro-installations. See: <https://www.ure.gov.pl/pl/rynki-energii/energia-elektryczna/odnawialne-zrodla-ener/potencjal-krajowy-oze/5753,Moc-zainstalowana-MW.html>

19 Ibidem.

20 <http://forum-energii.eu/en/analizy/polska-transformacja-energetyczna>

WHAT IS THE OUTLOOK FOR INNOVATION IN THE POWER MARKET?

Both overall electricity demand and peak power demand have been constantly growing in Poland²¹ and these trends are expected to continue in the coming years²². Despite Poland's retail electricity²³ and fuel prices²⁴ being moderate (i.e. well below the EU average), according to 2018 estimates ~12% of Poles are affected by energy poverty²⁵.

Energy efficiency is not considered as a priority among decision-makers. The main mechanism aimed at incentivising investments in energy efficiency, i.e. a white certificates support scheme, was established in 2011 and then repeatedly amended. However, despite many legislative interventions, this scheme is still being assessed as not working properly²⁶. In 2016 the International Energy Agency (IEA) said that while Poland had made large energy intensity improvements over the past two decades, it still remained above the IEA Europe average for energy efficiency²⁷.

The demand side response (DSR) market is just starting to develop. In 2017, the Polish Transmission System Operator (TSO) PSE held its first tenders for standby DSR and approximately 350 MW were contracted²⁸. This number almost doubled in 2018 - for the 2018-19 season, PSE has contracted 500-600 MW in DSR capacity²⁹. While the DSR tender scheme has been recently amended, the guarantee programme of emergency DSR will be repealed by 2021. From this date, DSR units will have to compete with traditional electricity providers, both in the capacity and electricity markets³⁰. According to the provisional results of Poland's first capacity market auction, held in mid-November 2018, more than 600 MW in such capacities have already been awarded capacity agreements. It proves that DSR can successfully compete with traditional generators³¹. The total economic potential of DSR in Poland has most recently been estimated at approximately 1,000 MW³². As this data concerns industrial DSR facilities, it is worth also noting that according to the recent draft legislative proposal, by the end of 2026 at least 80% of small-scale electricity customers will have to be equipped with smart electricity meters³³.

The ageing electrical grid needs significant investment. In the period between 2014-2019 alone, grid operators planned to invest ~€10bn in grid de-

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Energy efficiency is not considered as a priority among decision-makers

21 <http://forum-energii.eu/en/analizy/polska-transformacja-energetyczna>

22 <https://www.pse.pl/-/prognoza-pokrycia-zapotrzebowania-szczytowego-na-moc-w-latach-2016-2035>

23 http://ec.europa.eu/eurostat/statistics-explained/index.php/Electricity_price_statistics

24 http://ec.europa.eu/eurostat/statistics-explained/index.php/Natural_gas_price_statistics; http://ec.europa.eu/energy/observatory/reports/latest_prices_with_taxes.pdf

25 <http://ibs.org.pl/publications/jak-ograniczyc-skale-ubostwa-energetycznego-w-polsce/>

26 See for instance: <https://www.biale-certyfikaty.pl/blog/notowania-2Q2018>

27 https://www.iea.org/publications/freepublications/publication/Energy_Policies_of_IEA_Countries_Poland_2016_Review.pdf

28 <https://www.pse.pl/-/przetarg-na-uslugi-dsr-zakonczone-sukcesem-?safeargs=72656469726563743d68747470732533412532462532467777772e7073652e706c253246686f6d65253346705f705f696425334433253236705f705f6c6966656379636c6525334430253236705f705f73746174652533446d6178696d697a6564253236705f705f6d6f6465253344766965772532365f335f6b6579776f726473253344453522532365f335f67726f7570496425334432303138322532365f335f7374727574735f616374696f6e2533442532353246736561726368253235324673656172636826696e686572697452656469726563743d74727565>

29 <https://www.pse.pl/-/programy-dsr-nagrodzone-w-konkursie-nowe-impulsy-?safeargs=696e686572697452656469726563743d747275652672656469726563743d253246686f6d65>

30 http://ec.europa.eu/competition/state_aid/cases/272253/272253_1977790_162_2.pdf

31 https://www.pse.pl/aktualnosci-rynku-mocy/-/asset_publisher/XaFia9l65YKy/content/ogloszenie-wstepnych-wynikow-aukcji-glownej-na-rok-dostaw-2021?safeargs=696e686572697452656469726563743d66616c73652672656469726563743d68747470732533412532462532467777772e7073652e706c253246616b7475616c6e6f7363692d72796e6b752d6d6f63792533446705f705f69642533443130315f494e5354414e43455f5861466961396c3635594b79253236705f705f6c6966656379636c6525334430253236705f705f73746174652533446e6f726d616c253236705f705f6d6f646525334476696577253236705f705f636f6c5f6964253344636f6c756d6e2d32253236705f705f636f6c5f636f756e7425334431

32 <http://forum-energii.eu/en/blog/w-dsr-nadchodzi-wiosna>

33 <https://legislacja.rcl.gov.pl/projekt/12317354/katalog/12543041#12543041>

velopment³⁴. Local communities do not actively participate in the energy market, even though the government seems to support the idea of energy co-operatives and energy clusters. For instance, at present only one municipality in Poland (to a very limited extent) serves as an electricity Distribution System Operator (DSO)³⁵.

But change is afoot. The Act on Renewable Energy Sources was broadly amended (positively) in mid-2018³⁶ and the auction support scheme for electricity produced from RES has just started in Q4 2018 (after years of delay). The biggest utilities in Poland, not only from the power sector, are now seriously considering the development of multi-billion euro offshore wind projects³⁷.

The prosumer photovoltaic (PV) market has started growing. After repealing a feed-in tariff scheme that had never entered into force, in mid-2016 Poland introduced net metering for non-commercial prosumers (at present the net metering scheme covers RES micro-installations with installed capacity of up to 50 kW). At the end of Q2 2018 there were more than 36,000 individual prosumers in Poland (almost exclusively in photovoltaic technology) owning small-scale PV systems with cumulative electricity capacity of nearly 230 MW³⁸ (up from ~50 MW in mid-2016).

There are also an increasing number of renewable energy prosumers in the heating sector. The market for heat pumps is growing every year (Poland is unique in Europe in this respect): in 2017 alone, 23,000 new heat pumps were installed³⁹. According to 2015 data, ~2 GWth in individual, dedicated biomass-fired stoves and ~1.2 GWth in solar thermal collectors were used in Poland⁴⁰. On the other hand, the vast majority (more than 80%) of the energy consumed in Polish households (including heating, electricity and transport) comes from fossil fuels: coal, oil and gas⁴¹.

SECTOR COUPLING

Sector coupling (i.e. electrification of heating and transport) is at a very early stage of development. During 2017 only 439 new electric vehicles (EV) were registered⁴², but the number of EV charging stations is constantly increasing and according to the grid industry Poland will have 1,000 stations as soon as 2019⁴³.

The government has recently also started aiming towards the electrification of heating. At the beginning of 2018, a new "anti-smog" electricity tariff was introduced⁴⁴. However, after the first few months of application, the new tariff has reached only a few hundred clients⁴⁵ (it is worth noting that electrici-

34 http://www.ptpiree.pl/documents/sprawozdanie/ptpiree_raport.pdf

35 <http://uniejow.pl/dla-mieszkancow/energetyka-uniejow.html>

36 <http://www.dziennikustaw.gov.pl/DU/2018/1276/1>

37 <https://www.bloomberg.com/news/articles/2018-03-21/one-of-europe-s-biggest-polluters-is-turning-toward-wind-power>; <http://www.orken.pl/EN/Pres-sOffice/Pages/PKN-ORLEN-considers-construction-of-wind-farm-project.aspx>

38 <http://gramwzielone.pl/energia-sloneczna/33390/rekordowy-kwartal-na-polskim-rynku-mikroinstalacji>

39 <http://portpc.pl/spektakularny-wzrost-rynku-pomp-ciepla-polsce-2017-roku/>

41 Own calculations based on: <https://wysokienapiecie.pl/2221-zuzycie-energii-w-polsce-ogrzewanie-2016/> and <https://stat.gov.pl/obszary-tematyczne/srodowisko-energia/energia/zuzycie-energii-w-gospodarstwach-domowych-w-2015-r-.2,3.html>

42 Source: KMPG via <http://www.orpa.pl/sprzedaz-pojazdow-elektrycznych-w-polsce-europie-podsumowanie-2017-r/>

43 https://energetyka.wnp.pl/lawinowo-wzrosnie-w-polsce-liczba-ladowarek-samochodowych,331314_1_0_0.html

44 <http://www.dziennikustaw.gov.pl/DU/2017/2500/1>

45 <https://wysokienapiecie.pl/9357-rzadowe-sukcesy-porazki-w-walce-ze-smogiem-czy-taryfa-grzewcza-dziala/>

ty is the most expensive source of heating in Poland⁴⁶). Incidentally, at present, electric heating in Poland, which relies on coal-fired generators, may actually produce twice the CO₂ emissions per kWh of heat as individual coal-fired stoves⁴⁷.

INTERCONNECTION

While Poland's level of electricity interconnection is improving, it is still far from optimal. The existing interconnectors to Sweden (600 MW) and Lithuania (500 MW) have already proved to be key to Poland's energy security. On the other hand, loop flows from Germany have been preventing the existing interconnection capacity from being fully used⁴⁸. However, the level of cross-border electricity exchange has been constantly increasing⁴⁹ and as of 2014 Poland is a net electricity importer⁵⁰. The relaunch of the 500 MW Vierraden (GER) – Krajnik (PL) interconnector that has taken place in 2018⁵¹ would bring Poland's overall electricity interconnection to above 10% of the country's installed electricity generation capacity⁵² (having at least a 10% electricity interconnection by 2020 is an EU target). Additionally, the latest project of the Ten-Year Network Development Plan (TYNPD) by the European Network of Transmission System Operators for Electricity (ENTSO-E) is considering two new direct-current undersea interconnectors, linking Poland with Denmark (600 MW)⁵³ and Lithuania (500 MW)⁵⁴ that, if built, will further increase the country's interconnectivity and help reduce the mean carbon intensity of electricity used in Poland.

BATTERY STORAGE

Considering Poland's average electricity prices in recent years (wholesale: ~€40/MWh⁵⁵; retail, for households: ~€150/MWh⁵⁶) the business case for investments in battery storage, costing worldwide approximately €170/MWh⁵⁷, has not been economically viable to date. However, the number of pilot projects is increasing⁵⁸ and the business case for peak capacities such as battery storage should improve after the implementation of the capacity market. In the longer term, investments in such capacity should be incentivised by an additional scarcity pricing scheme that Poland has been obliged to implement by the European Commission's (EC) decision approving the capacity market⁵⁹.

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While Poland's level of electricity interconnection is improving, it is still far from optimal

46 Counting average cost of heating per square meter. Source: https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5485/2/3/1/zuzycie_energii_w_gospodarstwach_domowych_w_2015_r_.pdf. According to 2015 data, coal was the cheapest source of domestic heating in Poland.

47 Source: Polish Heat Pump Association via <http://www.rynekinstalacyjny.pl/artyku/id3840,pompa-ciepla-zamiast-kotla-weglowego>

48 <https://wysokienapiecie.pl/1295-situation-on-polish-german-border-poses-threat-of-european-blackout/>

49 <https://wysokienapiecie.pl/7178-import-pradu-najwyzszy-od-30-lat/>

50 <http://forum-energii.eu/en/analizy/polska-transformacja-energetyczna>

51 <https://www.montelnews.com/en/story/tsos-ready-to-relaunch-poland-germany-05-gw-link/924433>

52 <http://ec.europa.eu/transparency/regdoc/rep/1/2015/EN/1-2015-82-EN-F1-1.PDF>

53 <https://tyndp.entsoe.eu/tyndp2018/projects/projects/234>

54 <https://tyndp.entsoe.eu/tyndp2018/projects/projects/170>

55 <https://www.ure.gov.pl/pl/stanowiska/7479,Informacja-nr-282018.html>

56 This number includes also costs of the delivery of electricity: http://ec.europa.eu/eurostat/statistics-explained/index.php/Electricity_price_statistics

57 <https://about.bnef.com/blog/tumbling-costs-wind-solar-batteries-squeezing-fossil-fuels/>

58 See for example: <http://gramwzielone.pl/magazynowanie-energii/33075/najwiekszy-w-polsce-baterijny-magazyn-energii-przy-farmie-pv>

59 http://ec.europa.eu/competition/state_aid/cases/272253/272253_1977790_162_2.pdf. See also: <https://www.ure.gov.pl/pl/urzad/informacje-ogolne/aktualnosci/7519,Decyzja-Komisji-Europejskiej-zatwierdzajaca-rynek-mocy.html>

Moreover, the Ministry of Energy has recently published a draft legislative proposal aimed in particular at adopting a specific regulatory framework for storage installations⁶⁰.

KEY DRIVERS OF THE TRANSITION TO CLEANER ENERGY

Falling costs of wind (both onshore and offshore) and solar⁶¹, as well as increasing prices of the EU ETS allowances (EUAs)⁶² are commonly perceived as the main drivers of change⁶³. Due to the high dependence of the PPS on coal-fired generators, Poland's power prices are very vulnerable to EUA price increases⁶⁴. For instance, in September 2018, when EUA prices exceeded €25/tonne⁶⁵, baseload futures contracts on the Polish Power Exchange reached over PLN 300/MWh⁶⁶ (i.e. approx. €70/MWh). Such an increase in wholesale power prices improves the business case for renewable energy projects and means that RES installations are becoming extremely competitive with traditional energy sources. Some installations, such as onshore wind farms based on the most modern turbines, have already reached grid parity. This has been proven by the results of Poland's first-ever wind energy auction, held in November 2018, that averaged at ~€45/MWh⁶⁷.

POLAND'S ENERGY POLICY NEEDS AN UPDATE

Poland still does not have an up-to-date energy strategy. The last (formal) national energy policy was adopted in 2009 (it covers the period until 2030)⁶⁸. According to the Polish Energy Law Act, that policy should have been reviewed by late 2013, but the review process has not been completed to date. Interestingly, in 2017, Poland's former Deputy Minister of Energy stated that the lack of strategy is also a strategy⁶⁹.

Relying on a nine-year-old energy strategy during an era of technological breakthrough is, without argument, a completely outdated approach. For instance the (newer) National Renewable Energy Action Plan (from 2010) determined that in 2020 in Poland there will be only 3 MW of installed PV capacity⁷⁰, while Poland has already installed more than 300 MW in solar photovoltaics

60 <https://legislacja.rcl.gov.pl/projekt/12317354>

61 <https://about.bnef.com/blog/tumbling-costs-wind-solar-batteries-squeezing-fossil-fuels/>

62 <http://www.kobize.pl/pl/article/aktualnosci-2018/id/1100/aukcje-polskich-uprawnien-do-emisji>

63 <http://biznesalert.com/pge-is-between-the-nuclear-energy-and-res-interview/>

64 However, it must be noted that in the years 2021-2030 Poland will still be allowed to grant up to 60% of EUAs to the power sector for free, which may lower the actual impact of the rising carbon costs on the Polish power mix as compared to Western Europe's Member States. See the amended Article 10c (5) of the ETS directive: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L0410&from=PL>

65 <https://www.eex.com/en/market-data/environmental-markets/spot-market/european-emission-allowances#!/2018/09/10>

66 <https://wyniki.tge.pl/wyniki/rtee/tables/?date=2018-09-11>

67 <https://www.cire.pl/item,171835,1.html>

68 <http://www.me.gov.pl/files/upload/8134/Polityka%20energetyczna%20ost.pdf>

69 https://www.youtube.com/watch?v=yoVtN6_BMeQ

70 http://www.me.gov.pl/files/upload/12326/KPD_RM.pdf

(mostly in small-scale prosumer installations)⁷¹. As a result, political and legislative actions in the field of energy are carried out on an ad hoc basis, which has often led to regulatory chaos - especially visible in the RES sector.

CHANGE IS COMING

On the other hand, Polish decision-makers seem to have finally started to understand that there is no escape from global megatrends (including a need to rapidly reduce GHG emissions). In particular, in mid-2018, the parliament adopted a broad act on amending the RES and wind energy-related legislation („Act”) aimed at unlocking the development of new RES projects in Poland. The Act provides for auctioning of ~2.7 GW of new RES capacities by the end of 2018 (mostly in onshore wind and PV)⁷² and RES auctions for similar volumes are expected to be held in 2019 too⁷³. Moreover, for the first time in Poland, the Act introduces a simplified feed-in tariff (FiT) scheme, dedicated to biogas and hydroenergy installations of up to 500 kW. It also provides for a new feed-in premium (FiP) scheme for biogas and hydroenergy installations between 500 kW and 1 MW.

While the Act does not change certain obstacles to onshore wind, amendments in the Wind Energy Investments Act do enable the construction of onshore wind projects that have already been granted permits or are in the process of granting such a permit (and more than 1 GW of new onshore wind capacity has already been successfully auctioned this year)⁷⁴. The Act also significantly reduces the real property tax burden for wind turbines, to the level from before the adoption of the Wind Energy Investments Act. Moreover, under the amended legislation offshore wind farms will be able to participate in auctions before being granted a construction permit and the government is seriously considering the adoption of a new, separate law addressing the specifics of investment in offshore wind projects⁷⁵.

Furthermore, at the beginning of 2018, the parliament adopted a dedicated Act on Electromobility. The government also aims to have one million electric vehicles on the Polish roads by 2025⁷⁶ - a non-binding target that looks near impossible to achieve⁷⁷. The authorities are also working on a draft proposal for the new separate act on cogeneration (combined heat and power, CHP) setting up an auction support scheme for new CHP projects⁷⁸. And the government is still considering the construction of a nuclear power plant, justifying it in the name of climate protection⁷⁹.

The final version of the Act on the Capacity Market, which was adopted in late 2017, provides for a number of preferences to low-carbon generators, including:

- longer capacity agreements for generators meeting an emission performance standard (EPS) of 450g CO₂/kWh (i.e. gas-fired power plants, CHP and storage) of up to a maximum of 17 years;



Political and legislative actions in the field of energy are carried out on an ad hoc basis, which has often led to regulatory chaos

71 <http://ieo.pl/pl/aktualnosci/1253-ieo-dla-rzeczpospolita-u-progu-kolejnej-dekady-elektrownie-sloneczne-beda-druga-co-do-wielkosci-technologie-od-nawialna-w-polsce-pod-wzgledem-zainstalowanych-mocy>

72 <https://legislacja.rcl.gov.pl/docs//2/12299905/12442301/12442302/dokument330375.pdf>

73 <https://ieo.pl/pl/aktualnosci/1292-ministerstwo-energii-duze-wolumeny-na-aukcje-oze-rowniez-w-2019r>

74 Own calculations based on: <https://www.ure.gov.pl/pl/stanowiska/7816,Informacja-nr-912018.html> and <https://www.cire.pl/item.171835.1.html>

75 <https://energia.rp.pl/nowa-energia/13827-dunskie-wiatraki-chca-wejsc-polskie-morze>

76 http://www.me.gov.pl/files/upload/26095/20160616_prezentacja_OSTATECZNA1.pdf

77 Given that cumulative global sales of electric vehicles (EVs) have just exceeded 4 mln. See: <https://about.bnef.com/blog/cumulative-global-ev-sales-hit-4-million/>

78 <https://legislacja.rcl.gov.pl/projekt/12310101/katalog/12499846#12499846>

79 [http://orka.sejm.gov.pl/opinie8.nsf/nazwa/483_20171213/\\$file/483_20171213.pdf](http://orka.sejm.gov.pl/opinie8.nsf/nazwa/483_20171213/$file/483_20171213.pdf)

- multiannual agreements for DSR (for up to 5 years); and
- priority of granting aid to generators with lower EPS.

As a result of the first general certification to the capacity market, 4.37 GW of planned gas-fired units have entered the capacity market register, which has made gas-fired installations the largest group of submitted new investment projects⁸⁰. What is important from the perspective of the EU internal market is that the scheme will also be fully open to cross-border participation⁸¹. Nevertheless, Poland's first capacity market auction was dominated by coal-fired generators⁸².

MAIN CHALLENGES

AN EXCEPTIONALLY HIGH SHARE OF POLAND'S CARBON DIOXIDE EMISSIONS COME FROM THE ENERGY SECTOR

According to the latest available data, the energy sector (including heat) is still responsible for ~50% of Poland's yearly CO₂ emissions, while the EU average is only 30%⁸³. This results in particular from a very high carbon intensity of the PPS: the mean emission factor of the PPS still oscillates around 800g CO₂/kWh⁸⁴. This puts it in second place in the EU (after Estonia)⁸⁵.

THE DEVELOPMENT OF NEW COAL-FIRED POWER PLANTS CONTINUES

In December 2017, a new 1075 MW hard coal-fired unit at Koziencice Power Station started operation (it is the largest power unit in Poland) and an additional 3,210 MW of new coal-fired generators (in Opole, Jaworzno and Turów) are under construction⁸⁶. Moreover, there are proposals for subsequent coal-fired generators, including a 1,000 MW hard coal-fired unit at Ostrołęka Power Station⁸⁷ (construction slated for early 2019)⁸⁸ and a 500 MW integrated gasification combined cycle (IGCC) power unit near Łęczna⁸⁹.

80 https://www.pse.pl/aktualnosci-rynku-mocy/-/asset_publisher/XaFia9l65YKy/content/rynek-mocy-w-liczbach-certyfikacja-ogolna-20-1?safeargs=696e686572697452656469726563743d66616c7365

81 To learn more about the final version of the Polish Act on the Capacity Market, see ClientEarth's assessment report that is available here: <https://www.documents.clientearth.org/wp-content/uploads/library/2018-02-07-assessment-of-the-polish-act-on-the-capacity-market-ce-en.pdf>

82 Provisional results of this auction are available on: https://www.pse.pl/aktualnosci-rynku-mocy/-/asset_publisher/XaFia9l65YKy/content/ogloszenie-wstepnych-wynikow-aukcji-glownej-na-rok-dostaw-2021?safeargs=696e686572697452656469726563743d66616c73652672656469726563743d6874747073253341253246253246777772e7073652e706c253246616b7475616c6e6f7363692d72796e6b752d6d6f6379253346705f705f69642533443130315f494e5354414e43455f5861466961396c3635594b79253236705f705f6c6966656379636c6525334430253236705f705f73746174652533446e6f726d616c253236705f705f6d6f646525334476696577253236705f705f636f6c5f6964253344636f6c756d6e2d32253236705f705f636f6c5f636f756e7425334431

83 <http://stat.gov.pl/obszary-tematyczne/srodowisko-energia/srodowisko/rachunki-ekonomiczne-srodowiska,7,2.html>

84 http://www.kobize.pl/uploads/materialy/materialy_do_pobrania/wskazniki_emisyjnosci/180108_wskazniki_spalanie_na_mwh.pdf

85 <https://www.electricitymap.org/?page=map&solar=false&remote=true&wind=false>

86 <http://www.rynek-energii-elektrycznej.cire.pl/st,33,335,tr,145,0,0,0,0,budowane-i-planowane-elektrownie.html>

87 <http://elektrowniaostroleka.pl/>

88 <https://wysokienapiecie.pl/feeds/ntp-dla-wykonawcy-ostroleki-c-zostanie-wydane-po-aukcji-mocy/>

89 <https://umleczna.bip.lubelskie.pl/index.php?id=152&p1=szczegoly&p2=1223072>

The Wind Energy Investments Act (adopted in mid-2016) in its present form still virtually excludes the possibility of the development of new onshore wind projects in Poland



OVERALL DOWNTURN IN THE RENEWABLE ENERGY SECTOR

In recent years, most of the existing RES installations were loss-making, mainly due to the drop of green certificate prices⁹⁰ (as well as relatively low power prices). There have been no significant new investments in the RES power sector since mid-2016⁹¹. It is mostly because the new auction support scheme, adopted by the parliament in early 2015, did not actually start until late 2018. Prior to that, as regards new capacities, only two small “test” auctions for smaller PV installations have been held (in late 2016 and mid-2017).

THE WIND ENERGY INVESTMENTS ACT STILL BLOCKS ONSHORE DEVELOPMENTS

The Wind Energy Investments Act (adopted in mid-2016) in its present form still virtually excludes the possibility of the development of new onshore wind projects in Poland. The act states in particular that the distance, at which a wind turbine may be located from a residential building shall be at least ten times the wind turbine tip height (the so-called “10H rule”). Only pending projects (i.e. projects that at least had applied for a construction permit before the

90 <https://wysokienapiecie.pl/2337-70-farm-wiatrowych-przyniosla-straty/>

91 <https://www.ure.gov.pl/pl/rynki-energii/energia-elektryczna/odnawialne-zrodla-ener/potencjal-krajowy-oze/5753,Moc-zainstalowana-MW.html>

act entered into force) do not have to meet the 10H rule (the total capacity of such projects is estimated at at least 2-3 GW)⁹². There are no plans to install new onshore wind capacity beyond this, unless the Act is broadly amended or repealed.

LACK OF ENERGY STRATEGY

The lack of an up-to-date energy strategy (since late 2013) has been causing substantial investment uncertainty in the energy sector. The IEA reviewed Poland's energy policies in late 2016 - its main recommendation to the government was to swiftly adopt a long-term, transformative energy strategy⁹³. It noted that "Poland is less supportive of energy system transformation (as compared to other IEA member countries) and foresees fossil fuels as a fundamental element of its energy system over the long term"⁹⁴.

In this context, the good news is that at the beginning of October 2018, the Deputy Minister of Energy announced that the new draft energy policy had already been accepted by the Ministry⁹⁵. The document was finally submitted for public consultations one week before the start of COP24⁹⁶. Consultations will last until mid-January 2019.

POLAND AND THE CLEAN ENERGY PACKAGE

The new package of EU energy laws (the "Clean Energy for all Europeans" package, commonly referred to as the Winter Package or the Clean Energy Package, "CEP") is set to be adopted imminently. This set of regulations should be a major accelerator of Poland's energy transition.

The eight-law strong CEP, launched in late 2016, finally started taking its final shape during 2018. In July, the first act of the package entered into force - concerning energy-efficient buildings⁹⁷. Towards the end of spring 2018, three more laws on climate, renewables and energy efficiency were agreed on and should soon be formally adopted and published. The remaining laws are expected to be agreed in early 2019.

In general, the Polish government has not seemed to be against the CEP. However, it has been opposing a number of targeted, key proposals, including in particular:⁹⁸

92 There are estimates that even 7 GW in new onshore wind installations are ready to be built in Poland. See: <https://ieo.pl/pl/aktualnosci/1305-projekt-wiatrowe-w-polsce-2018>

93 https://www.iea.org/publications/freepublications/publication/Energy_Policies_of_IEA_Countries_Poland_2016_Review.pdf

94 Ibidem.

95 <http://biznes.pap.pl/en/news/all/info/2615844.polityka-energetyczna-kraju-przyjeta-przez-kierownictwo-resortu-energii-%E2%80%93-wiceminister>

96 It is available here: <https://www.gov.pl/web/energia/polityka-energetyczna-polski-do-2040-r-zapraszamy-do-konsultacji>

97 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L0844&from=EN>

98 http://www.sejm.gov.pl/Sejm8.nsf/transmisje_arch.xsp?page=2#A255EA17CC153418C12580AD00422224

- EPS of 550g CO₂/kWh in the national capacity mechanism: Poland (as other Member States) has adopted a capacity market without a minimum, binding EPS threshold and the future design of this mechanism depends on the final shape of the recast regulation on the internal market for electricity⁹⁹;
- State aid limitations for firing biomass (the final shape with regard to these limitations has already been agreed: in particular they include the lack of possibility to grant public support for new plants co-firing biomass with coal);
- more regionalisation of the EU electricity market and the transfer of competencies to a supranational level (for instance to Regional Operational Centres, ROCs);
- the Polish authorities have also welcomed the proposals for the removal of priority dispatch for RES and the lack of binding national RES targets after 2020 (also already agreed at the EU political level).

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Poland has had serious problems with the transposition of the previous EU energy package

On the other hand, the Polish government has publicly backed some particularly progressive parts of the CEP, with a focus on empowering people in the clean energy transition. These include provisions on¹⁰⁰:

- active customers (prosumers);
- local renewable energy communities that seem to correspond to the Polish government's energy clusters concept;
- the promotion of smart grids; and
- requirements with regard to more clarity for energy consumers.

However, it is worth remembering that Poland has had serious problems with the transposition of the previous EU energy package. Today, after many years of delay, mandatory parts of the 2009 package have finally been transposed. However, it would be fair to expect that Poland will have similar troubles with the implementation of the new, much more extensive and complex, CEP.

For example, by the end of 2018, the government will have to submit to the EC its draft national energy and climate plan (NECP) - a document similar to the country's energy policy that is also to cover climate protection in other sectors. In fact, preparing for the NECP has pushed Polish authorities to finally update energy policy adopted on the basis of national energy law. In our view, the combined effect of the new governance regulation and the amended RES directive should speed take-up of RES in Poland's power sector.

What is more, the first directives covered by the CEP will have to be transposed into national legislation as soon as in 2020. And even before that, in 2019, the country will have to transpose the provisions included in the amended ETS directive. As in the case of the previous EU climate and energy package, a timely transposition and the exact shape of national provisions will be of crucial importance for meeting the key objectives of these new EU regulations.

99 See point 133 of the EC's decision approving the Polish capacity market: http://ec.europa.eu/competition/state_aid/cases/272253/272253_1977790_162_2.pdf

100 Ibidem.

PREDICTIONS FOR THE COMING YEARS



Poland will likely miss its 2020 EU RES targets, in particular because of a far insufficient share of RES in transport

The medium-term power generation trend indicates slow diversification leading to increased production from RES and natural gas¹⁰¹ and this trend is expected to continue. According to the latest information that was presented by Polish State-owned power utilities to the parliament, their current generation investment plans cover almost exclusively renewable and gas-fired installations¹⁰².

In the coming years, RES capacity additions should start to grow again. By the end of 2018, auctions should be concluded for up to 2.7 GW of new RES capacities (mostly in onshore wind and solar) and similar auctions are expected to be held in 2019. According to the latest predictions, by the end of 2020 Poland may be operating PV installations with a cumulative capacity of between 1.2 and 3.2 GW (depending on the future volumes provided for new PV installations under the auction scheme)¹⁰³. This all means that as soon as 2021, around 25% of Poland's installed electricity capacity may be renewable¹⁰⁴.

However, Poland will likely miss its 2020 EU RES targets¹⁰⁵, in particular because of a far insufficient share of RES in transport¹⁰⁶. In 2016, the share of RES in transport dropped to less than 4% (as compared to the 10% 2020 target)¹⁰⁷. Although gross final consumption of energy from renewable sources has been growing, in 2016 the overall share of energy from RES – for the first time in recent years – slightly dropped (due to the increase in energy consumption). In 2016, the country's share of energy from RES was 11.3%, down from 11.93% in 2015¹⁰⁸. According to the just-revealed official data, in 2017 the share of renewables fell for a second year in a row, to 11%¹⁰⁹ (Poland's 2020 RES target is 15%).

Various analyses prepared for the EC show that the volume of Poland's electricity produced from RES should ~double by 2030¹¹⁰. The share of gas-fired generation in the country's energy mix is constantly increasing and is expected to further increase¹¹¹. However, according to the available modelling, in 2030 approximately 50-60% of electricity in Poland will probably still be produced from coal¹¹².

The future carbon intensity of Poland's power mix depends on a scenario of the development of the PPS. In a high wind and solar penetration scenario or in a nuclear scenario the PPS's carbon intensity could be reduced by half (i.e. to ~400g CO₂/kWh) by 2035¹¹³.

101 <http://forum-energii.eu/en/analizy/polska-transformacja-energetyczna>

102 http://www.sejm.gov.pl/Sejm8.nsf/transmisje_arch.xsp?page=2#EB2AC2A0C2A9775AC125830F00450499

103 <https://ieo.pl/pl/aktualnosci/1289-olbrzymi-ale-niewykorzystany-potencjal-fotowoltaiki-3-2-gw-w-fotowoltaice-w-2020-roku-to-realny-scenariusz-majacy-oparcie-w-projektach>

104 Today this share is slightly under 20%.

105 This is forecasted by many institutions. See for example the conclusions from this Ecofys's analysis: <https://www.pv-magazine.com/2017/04/26/poland-to-miss-2020-eu-renewable-energy-target-ecofys/>

106 http://ec.europa.eu/eurostat/statistics-explained/index.php/Renewable_energy_statistics

107 https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5485/3/11/1/energia_ze_zrodel_odnawialnych_2016.pdf

108 Ibidem.

109 Also mainly due to the increase in overall energy consumption. See: <http://stat.gov.pl/obszary-tematyczne/srodowisko-energia/energia/energia-ze-zrodel-odnawialnych-w-2017-roku,10,1.html>

110 https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Feb/IRENA_REmap_EU_2018.pdf; https://ec.europa.eu/energy/sites/ener/files/mainstreaming_res_-_artelys_-_final_report_-_version_33.pdf

111 <https://wysokienapiecie.pl/9288-rekordowy-czas-dla-polskiego-ryнку-gazu-pgnig/>

112 <http://forum-energii.eu/en/analizy/polska-transformacja-energetyczna>

113 <http://www.chronmyklimat.pl/download.php?id=424>

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