Renewable energy – a challenge for the countries of Central and Eastern Europe

The global rate of RES (renewable energy sources) generation proves that it has been the fastest developing source of energy in the last decade. / The global rate of electricity production from RES (in TWh) was 12.59% for wind power, 28.91% for solar power and 6.98% for other sources, while in the European Union the rates were 4.63%, 7.29% and 3.44% respectively. This means that EU is below the global average and, what is even worse, below the average for OECD countries. / Poland has a large share of wind power (12.8 TWh) and a small share of solar power (0.3 TWh). / In Central and Eastern Europe the countries usually apply relatively passive renewable energy policy. / The COVID-19 pandemic caused a demand and supply shock on the market of energy raw materials. It also showed that the European Union depends too much on the imported RES technologies and RES intermediate products.

The global rate of RES (renewable energy sources) generation proves that it has been the fastest developing source of energy in the last decade. In 2007-2017 the global production of renewable energy, expressed in terawatt-hours (TWh), was 14.5%, and in 2018 it was also 14.5%. The growth rate of energy production from RES in the European Union, which is traditionally regarded to be the most determined to reduce CO2 emissions by the development of RES, was lower than the global growth rate; in 2007–2017 it was 12.8% and in 2018 it was 4.8%. Summing up, the European Union, producing 28.4% of energy from RES (in 2018), lowered its growth rate of energy production from RES.

Production of renewable energy is unevenly distributed among countries, which also refers to the sources of this production. The RES segment has a visibly large share of power production from wind (12.8 TWh in Poland and 6.5 TWh in Romania), and a small share of solar power production: 0.3 TWh and 1.7 TWh respectively in 2018. An inverse situation is in Czechia, where in 2018 solar power prevailed (2.3 TWh) over wind power (0.6 TWh). In some countries, such as Czechia (4.7 TWh) and Hungary (2.4 TWh) a considerable share of other sources in total RES production was observed in 2018 (Other sources of RES electricity are: geothermal energy, biomass and biogas). The global rate of electricity production from RES (in TWh) was 12.59% for wind power, 28.91% for solar power and 6.98% for other sources, while in the European Union the rates were 4.63%, 7.29% and 3.44% respectively. It is undoubtedly worth to bear in mind that EU (with the changes of 4.63% for wind, 7.29 for solar power and 3.44% for the other) is below the global average and, worse still, below the OECD average. Juxtaposition of percentage growth of electricity production from RES shows that the 4.76% growth is almost twice smaller than growth for OECD (8.56%). Only Ukraine showed exceptionally high rates for all the categories (wind, solar and other power) with its YOY (2017 to 2018) increase of 15.65%, and 69.71% and 33.70%. For the first two categories (wind and solar power) Belarus reached results exceeding the EU average – 21.63% and 51.11%. This group also includes Hungary (68.73%) and Poland (81.21%) in the solar power category.

Countries with low share of power production from a specific source showed high growth, which can indicate that, on one hand the process may be impermanent, and on other hand that increasing RES share faces barriers that restrict the growth.

There is considerable potential for the development of renewable energy in Central and Eastern Europe, but it is not utilised yet, since it still has not been subject to systemic energy transformation. The energy transformation based on civic energy assumes conveying renewable energy production to societies, or local communities, who are the infrastructure owners and who manage it. Such energy transformation aimed at renewable energy brings measurable benefits not only to large corporations, but also to households, local governments,

TABLE 1. Growth rate for power production from RES in 2017–2018

Country	2017 (TWh)				2018 (TWh)				Dynamika r/r (%)			
	wind power	solar power	other renewable energy	total	wind power	solar power	other renewable energy	total	wind power	solar power	other renewable energy	total
Belarus	0.1	0.1	0.1	0.3	0.1	0.1	0.1	**0.4**	21.63	51.11	2.97	23.84
Czech Republic	0.6	2.2	5.0	7.7	0.6	2.3	4.7	**7.7**	3.09	6.62	–4.76	–0.94
Germany	105.7	39.4	51.1	196.2	111.6	46.2	51.4	**209.2**	5.58	17.16	0.67	6.63
Hungary	0.8	0.3	2.1	3.2	0.6	0.6	2.4	**3.6**	–19.79	68.73	10.80	9.89
Poland	14.9	0.2	6.5	21.6	12.8	0.3	6.3	**19.5**	–13.84	81.21	–2.42	–9.68
Romania	7.4	1.9	0.5	9.8	6.5	1.7	0.5	**8.6**	–12.29	–9.81	–12.08	–11.80
Ukraine	1.0	0.8	0.2	1.9	1.1	1.3	0.2	**2.6**	15.65	69.71	33.70	38.82
Total (Europe)	**384.3**	**124.5**	**208.2**	**717.1**	**404.4**	**139.1**	**217.6**	**761.1**	**5.22**	**11.65**	**4.51**	**6.13**
Total (global)	**1128.0**	**453.5**	**585.0**	**2166.5**	**1270.0**	**584.6**	**625.8**	**2480.4**	**12.59**	**28.91**	**6.98**	**14.49**
OECD	695.1	285.7	363.9	1344.8	745.8	337.2	377.3	**1460.3**	7.29	18.01	3.66	8.59
Non-OECD	432.9	167.8	221.0	821.7	524.1	247.4	248.6	**1020.1**	21.09	47.47	12.45	24.15
European Union	362.0	119.1	192.4	673.5	378.8	127.8	199.0	**705.5**	4.63	7.29	3.44	4.76

Source: own study by SGH Warsaw School of Economics based on [*BP Report* 2019].

ENERGY AND COVID-19

The COVID-19 pandemic caused a demand and supply shock on the market of energy raw materials, resulting in very low prices of crude oil, gas and coal, which are the basic source of energy in the region and the rest of the world, despite the dynamic growth of power production from RES. WTI crude oil reached the lowest price on 27 April 2020 (USD 12.91 per barrel). Gas prices fell in the first half of 2020 by 25%, reaching USD 1.8 per Btu, while ARA coal price dropped from USD 61.15 per ton (2 January 2020) to USD 50.6 per ton (4 June 2020).

The supply and demand shock on the energy market is going to cause a problem with effectiveness of the currently applied instruments of RES support, since other traditional energy sources are becoming more competitive. Considering also substantial uncertainty about future consumption of energy in the region, and thus the scope of impact of the pandemic on GDP, it should be highlighted that enterprises and financial institutions are going to be willing to take risks of new investments in electricity production. Also the European Commission and some European Union States point out that a way to boost the economy may be not only further energy transformation, but also its acceleration. In consideration of the fact that the European Union lost its leading position in power production from RES before the pandemic, the aspiration to accelerate the development of renewable energy sources is justified.

The pandemic showed that the European Union is excessively reliant on imported RES technologies and intermediate products, which poses a significant problem that must be solved in the future (by high-level agendas). Otherwise the support mechanism will be able to drive the EU economy only to a limited degree. The possibility to materialize this idea will depend both on the effectiveness of the applied policy instruments (such as EU ETS, which turned out to be ineffective during the 2008–2009 crisis) and the volume of financial resources involved.

From the perspective of the region the biggest benefits from boosting the economy can be found in: development of offshore wind power (Poland, Lithuania, Latvia, Estonia), solar energy and hydropower in Romania and Bulgaria, development of electric power transmission grid and improvement of energy efficiency of family houses in Poland, while in Ukraine – both family and multi-dwelling units.

SMEs and farmers. In the entire EU, especially in Western Europe, the energy transformation based on civic energy is gaining momentum. In the countries of Central and Eastern Europe however the situation is utterly different – the states mostly effect passive policies regarding civic renewable energy, and projects aimed at building such energy system are practically non-existent.

KRZYSZTOF KSIĘŻOPOLSKI, doctor of humanities, Department of Public Policy of SGH Warsaw School of Economics; **DARIUSZ KOTLEWSKI**, doctor of economic sciences, Department of Economic Geography of SGH Warsaw School of Economics; **GRZEGORZ MAŚLOCH**, doctor of economic sciences, Department of Local Government Economy and Financing of SGH Warsaw School of Economics