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MEETING THE EUROPE 2020 STRATEGY SUSTAINABLE DEVELOPMENT GUIDELINES BY POLAND*

WYKONANIE WYTYCZNYCH STRATEGII "EUROPA 2020" W ZAKRESIE ZRÓWNOWAŻONEGO ROZWOJU W POLSCE

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Summary: Many documents produced by the EU, including the Europe 2020 Strategy, advocate the assumption that the European Union member states will strive to achieve sustainable development, which therefore needs to be measured with comparable parameters. The research objective was to evaluate sustainable growth indicators in Poland against the background of the same indicators in the European Union, and to 'estimate' chances to achieve the objectives set in the Europe 2020 Strategy. Two hypotheses were put forward in the study: a large number of indicators analysed by the Main Statistical Office in Poland allows forecasting the achievement of Poland's objectives adopted in the Strategy; the most difficult to achieve will be the goal of financing research and development. In Poland, not all the changes were beneficial. The EU as a whole has the chance to approximate to the set value of the indicators. Both hypotheses were verified.

Keywords: strategy, sustainable development, indicators.

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Streszczenie: Wiele dokumentów opracowanych przez UE, w tym strategia „Europa 2020", opowiada się za założeniem, że państwa członkowskie Unii Europejskiej będą dążyć do osiągnięcia zrównoważonego rozwoju, który w związku z tym należy mierzyć za pomocą porównywalnych parametrów. Celem badań była ocena wskaźników zrównoważonego wzrostu w Polsce na tle tych samych wskaźników w Unii Europejskiej oraz „oszacowanie" szans na osiągnięcie celów określonych w strategii „Europa 2020". W badaniu wysunięto dwie hipotezy: duża liczba wskaźników analizowanych przez Główny Urząd Statystyczny w Polsce (GUS) pozwala prognozować realizację celów Polski przyjętych w strategii. Najtrudniejszy do osiągnięcia będzie cel finansowania badań i rozwoju. W Polsce nie wszystkie zmiany były korzystne. UE jako całość ma szansę zbliżyć się do ustalonej wartości wskaźników. Obie hipotezy zostały zweryfikowane.

Słowa kluczowe: strategia, zrównoważony rozwój, wskaźniki.

1. Introduction

Many documents produced by the EU, including the Europe 2020 Strategy, advocate the assumption that the European Union member states will strive to achieve sustainable development which, therefore, needs to be measured with comparable parameters. When discussing sustainable development indicators, it is worth considering what stimulates an interest in the concept of sustainable growth. The last few decades of economic growth have led to drastic, often irreversible changes in ecosystems, although the constantly increasing wealth and improved economic spheres of life quality have been perceived as great advantages. The world's economic growth has taken place at the expense of the natural environment, including shared resources (Commoner, 1974; Welzer and Wiegandt, 2001). It was not until U'Thant's Report was published in 1969 that cause-and-effect relationships in the state of the Earth's natural environment were demonstrated and the possible fate of the human race was foreseen in the event of a lack of prevention measures. The report changed the awareness of the international community and politicians. The ensuing discussions and events over the subsequent decades have substantiated the idea of sustainable development. The aim and a potential outcome of sustainable growth is an adequate quality of life (Burchard-Dziubińska, 2001), which can be seen today as a category opposite to quantity. More about life quality in the context of sustainable development can be found in Kryk (2012). Natural resources are one of the most important factors of economic growth (Costantini and Martini 2010; Lee, Chang, and Chen 2008; Stern, 2011; Stern and Cleveland, 2004). In the past few years many concepts have been developed, supported by social research, which suggest that, having reached a certain level, an increase in wealth does not translate into satisfaction with life. Subsequent increments in wealth (most often measured by a growth in GDP) do not stimulate a desire to own material goods, but give rise to other needs. This proves that the quality of life does not depend exclusively on one's ability to secure material needs (Hoppe, 2012). Rapidly changing needs have necessitated changes in the

approach to sustainable growth. Thus, rather than stopping at the stage of producing numerous definitions and principles, the concept of sustainable growth has been developing dynamically to date. According to Borys (2014), the principal idea of sustainable growth, which proclaims the right to satisfy the development aspirations of the present generation without compromising the rights of future generations to satisfy their development needs, has become too vague in the presence of a new paradigm of development (sustainable, durable, self-sustaining growth, eco--development). The paradigm of sustainable development accepted and developed on theoretical grounds by scientists and politicians is not reflected in socio-economic practice in which the deepening of the disproportions in the accessibility and quality of environmental goods can be observed. It is necessary to seek new instruments and methods for implementing environment policy integrated with the policy. The ongoing changes should mobilize local authorities to actively control development processes and take initiatives for the efficient management of their territory (Rzeńca, 2015).

Specific measurable identification parameters and goals to be attained at particular levels of management are currently needed, and such an approach calls for the monitoring and assessment of sustainable development over time, which requires measurable and comparable indicators. More on the achievements in the research methodology in this domain can be found in Borys (2005), Sahely, Kennedy and Adams (2005), Delzeit, Holm-Müller (2009), Goldschmidt, Harrison, Holtry and Reeh (2013), and Borychowski, Staniszewski and Zagierski (2016).

Therefore the question arises as to whether at the current pace of change, with the measurement indicators proposed by the public statistics in Poland, it is possible to analyse and anticipate the achievement of the 2020 Strategy. Two hypotheses were put forward in the study: the large number of indicators analysed by the Main Statistical Office in Poland allows for forecasting the achievement of Poland's objectives adopted in the Strategy; the most difficult to achieve will be the goal of financing research and development.

2. Literature review

The plan for social and economic development adopted by the European Council in the year 2000, called the Lisbon Strategy, has failed to generate the expected positive outcomes. Many have noted that the Lisbon Strategy has faced failure mainly because of its supply-side and market-liberal orientation Kėdaitienė and Kėdaitis 2009, Fischer, Gran, Hacker, Jakobi, Petzold, Pusch, and Steinberg, 2010). The major goal of that strategy was for the European Union to achieve a leading economic role in the world by the year 2010. The EU member states were supposed to have become economic leaders, surpassing the USA in this capacity, and distinguished by durable and sustainable growth. An in-depth discussion concerning the mutual relationships between the Lisbon Strategy and sustainable development (SD) was presented by

Steurer and Berger (2007), who analysed the problems arising from the lack of cohesion between strategic documents and applied indicators on an international level. The cited authors provide examples of case studies which demonstrate that despite its failure in reaching specific targets, the Lisbon Strategy was much more successful overall than sustainable development (SD) strategies. More about the Lisbon Strategy can be found in Domorenok (2009), Radulova (2009), Sánchez (2009) and about sustainable development strategies in Steurer and Martinuzzi (2010), and Steurer, Berger and Hametner (2010). Leaving aside single cases of the success of the Lisbon Strategy, worth noting are the difficulties in reaching the shared objectives of the EU countries and in analysing the ongoing performance of the set goals. There were many reasons, from insufficient cohesion through excessively developed goals to exorbitant costs (Żmuda, 2011). While avoiding disputes over the reasons for the difficulties, but taking advantage of the experience gained from failing to attain the set objectives, it was advisable to propose a new strategy adjusted to the new conditions emerging after the economic crisis. In March 2010, the European Commission announced a new, 10-year strategic plan, called *Europe 2020. A strategy for smart, sustainable and inclusive growth*. The strategy was preceded by a number of consultation documents (Consultation of European Regions… 2009) produced by the European Commission, which proposed models for the development of the European Union.

The Europe 2020 Strategy comprises three interconnected priorities: intelligent, sustainable and socially inclusive development. Intelligent development is economic growth based on knowledge and innovation; sustainable development means promoting a more resource efficient economy; socially inclusive development supports a high--employment economy ensuring economic, social and territorial cohesion.

The question that the Europe 2020 Strategy asks is 'where we want Europe to be' in the year 2020. In an attempt to resolve this issue, the Commission proposed defining a few superior goals to be achieved by the EU. Due to the different starting points in individual member states, different achievement levels were established. For example, the following goals were set:

- to raise the employment rate of the population aged 20-64 to at least 75% in the EU and, specifically, to 71% in Poland;
- to achieve the target of investing 3% of GDP in the EU and 1.7% in Poland into R&D;
- to achieve the "20/20/20" goal in the domain of climate and energy in the EU (including a reduction of carbon dioxide emissions by as much as 30% if the conditions are right), but the goal in Poland is to reduce the consumption of primary energy to about 96 Mtoe, to increase the share of renewable energy and to reduce CO_2 emissions;
- to reduce the number of early school leavers to 10% in the EU and to 4.5% in Poland, and to increase the share of the population with tertiary education to at least 40% in the EU and 45% in Poland;

- to reduce the number of persons living below the poverty line by 20 million in the EU and 1.5 million in Poland (http://ec.europa.eu/europe2020/pdf/energy2_pl.pdf).

However the problem is still how to measure the effects and the probability of these achieving goals. Baležentis, Baležentis, and Brauers (2011) presented a measurement method for the assessment of many objectives of the Europe 2020 Strategy measured using the MULTIMOORA (Multi-Objective evaluation method). In the final conclusion, however, it was found that further research is needed with coefficients corresponding to the objectives.

3. Methodology

This paper analyses sustainable growth indicators in Poland against the background of the same indicators in the European Union, and 'estimates' the chances to achieve the objectives set out in the Europe 2020 Strategy. The current analysis is comprised of values of the indicators given in the years 2004 and 2015 (in some cases other years were taken into consideration, depending on the availability of data). The indicator comparative method was applied to analyse values of indicators accessible in the module for Poland and for the EU. More on the selection of domains and indicators available in the module is available from Balas & Molenda (2016). The approach implemented in this study deals with four themes and the domains included in these themes (Table 1).

Table 1. Themes, domains and number of indicators* considered in the national module (international comparisons) presented by GUS (Main Statistical Office in Poland)

Social theme (23)	Economic theme (21)	Environmental theme (10)	Institutional and political theme (9)
Demographic changes (2)	Economic growth (8)	Climate change (2)	Civil society – open, participating and active citizens (3)
Public health (9)	Employment (4)	Energy (4)	Financing sustainable development (1)
Poverty and living conditions (3)	Innovation (4)	Land use (1)	Policy of cohesion and efficiency (1)
Education (4)	Transport (3)	Waste management (3)	
Access to labour market (4)	Production patterns (2)		Globalisation of commerce (1)
Consumption patterns (1)			Equality in management (3)

* Numbers in brackets stand for the number of indicators in a given domain.

Source: own elaboration based on (http://wskaznikizrp.stat.gov.pl/).

The sources of data consisted of the GUS (Main Statistical Office in Poland) domestic module for international comparisons (accessed on http://wskaznikizrp.stat.gov.pl/). The indicators were either stimulants (the more, the better) or

destimulants (the more, the worse). For each indicator the so-called demonstrating value was calculated, showing by what percentage the indicator value for Poland was better or worse than the average value for the 28 EU countries. The data for the EU in 2004 were calculated for all the countries which are now in the European Union, regardless of the date of their accession. The assessment was made according to the following formulas:
for stimulants

$$O_i = \frac{W_i - W_{\min}}{W_{\max} - W_{\min}},$$

for destimulants

$$O_i = \frac{W_{\max} - W_i}{W_{\max} - W_{\min}}$$

by what percentage the indicator was better or worse than the average

$$O = \frac{O_i}{O_{average}} \times 100\% - 100\%,$$

where: O_i – value of indicator W_i for Poland, converted to a zero to one scale; $O_{average}$ – average value of the indicator for the European Union, converted to a zero to one scale; O – assessment; W_i – value of the indicator for Poland; $W_{\min}$ – minimum value of the indicator among the EU countries; $W_{\max}$ – maximum value of the indicator among the EU countries.

As a result, an assessment was made for each indicator, showing how it was better or worse in Poland compared to the EU average (Rogala, 2005). The results were described and presented in the form of tables.

4. Research results

Considering the key goals, identified above, and using the available data, an indicator method was applied to make an assessment of the sustainable indicators for Poland in four domains: social, economic, environmental as well as institutional and political. For each domain, the indicators available in the national module of the GUS Main Statistical Office were selected, accessed on http://wskaznikizrp.stat.gov.pl/. The assessment comprised two threshold years for which data for a given indicator were available: the oldest available year was 2004 and the most recent one was 2015.

The highest number of indicators prepared by GUS pertained to the social domain (24). Among the indicators within this domain in 2014 or 2015, half (12) obtained values above the average. These were indicators of migration abroad, standardised indicators of death due to lower respiratory apparatus disorders,

exposure of the population to ozone-polluted air, poverty or social exclusion risk, income distribution inequalities, adolescent school leavers, percentage of the population aged 25-64 with no more than lower secondary education, percentage of persons in households without employed persons who are aged 18-59, the long-term unemployment rate, the Labour Force Survey (BAEL) unemployment rate, differences in remunerations between men and women, and electric energy consumption in a household per capita. The assessed value has decreased since 2004, which is an undesirable tendency. The most beneficial change was noted in the indicators connected with unemployment and social exclusion. Four of the analysed indicators (destimulants) increased from values below the average in 2004 to values above the average at the end of the analysed time period: long-term unemployment rate, BAEL unemployment rate in total (in 2004 the value of this indicator in Poland was the highest in the EU), percentage of persons in households without employed persons aged 18-59 (in 2004, the value of this indicator for Poland was the highest in the EU) and the indicator of poverty or social exclusion risk (Table 2; Figure 1).

These indicators are inscribed in the target goals of the Europe 2020 Strategy, which envisages an increase in employment among 20-64-year-old persons and a decrease in the number of people threatened by poverty and social exclusion. Of the 24 analysed indicators, 14 scored higher at the end of the analysed time period than at its beginning, and 10 were noted to have achieved lower scores. The total fertility rate in Poland in 2004 was the lowest among all EU countries but rose from 100% below the average by just 4 percentage points to 96%. In 2015, the lowest score was obtained by the European Health Consumer Index, EHCI.

With respect to the economic domain, seven of the 21 analysed indicators scored higher than the EU average in 2015 (Table 2; Figure 1). However, the scores were higher than in 2004 in just three cases: investment rate, debt of the government sector and local government institutions relative to GNP, and the GDP transport capacity passenger transport. Five indicators scored worse, although three: share of rail and inland waterways transport in total transport – freight transport, railway transport, share of rail and inland waterways transport in total transport – passenger transport: trains, the GDP transport capacity – freight transport, reached scores above the EU average. Fourteen indicators in both analysed years attained scores higher than the EU average. It is worth noting the destimulant: energy consumption of transport relative to GDP, in which Poland had the lowest score among the EU countries in 2004, thus obtaining a very high score of 181.03% above the EU average. Unfortunately, the score gained in 2014 was lower by 124.14 per cent points. Further to the Strategy 2020's objectives, it should be highlighted that the employment rate among 20-64-year-olds was above the EU average in both years, but it rose considerably since 2004 by as much as almost 85 percentage points. Similarly, Poland's inputs into R&D relative to GDP were lower than the EU average in both years, but increased since 2004 by 19.5 per cent points.

Table 2. Assessment of sustainable development indicators

Name, character* and number of the indicator			
social	economic	environmental	political
Fertility rate (S) (1)	Growth in gross domestic product per 1 inhabitant (%) (S) (25)	Share of renewable energy in gross final energy consumption (%) (S) (46)	Official development assistance (ODA) to developing countries (%) (S) (55)
Real population growth/loss (S) (2)	Investment rate (%) (26)		
Expected healthy life years for 65-year-olds. Men (S) (3)	Outcome (surplus/deficit) of the sector of government and local government institutions relative to GDP (%) (S) (27)		
Expected healthy life years for 65-year-olds. Women (S) (4)			
European Health Consumer Index (points) (S) (5)	Gross domestic product per capita according to PPP (%) (S) (28)	Share of renewable energy in fuel consumption of transport (%) (S) (47)	Import from developing countries. Countries on the OECD DAC list of development aid recipients (billions of euro) (S) (56)
Adult participation in learning and training (%) (S) (6)	Employment rate among 20-64-year-olds (%) (S) (29)		
Public expenditure on education relative to GDP (%) (S) (7)	Duration of working life (years) (S) (30)		
Foreign migration rate (‰) (D) (8)	Occupational activity rate (%) (S) (31)		
Standardised death rate due to circulation system disorders (per 100 000 people) (D) (9)	Human resources in science and technology (%) (S) (32)		
Standardised death rate due to malignant neoplasms (per 100 000 people) (D) (10)	Labour productivity (%) (S) (33)	Forest land cover (%) (S) (48)	Voter turnout in EU parliamentary elections (%) (S) (57)
Standardised death rate due to lower respiratory apparatus diseases (per 100 000 people) (D) (11)	Expenditure on R&D relative to GDP (%) (S) (34)		
Standardised death rate due to diabetes (per 100 000 people) (D) (12)	Number of inventions submitted by residents to the European Patent Office per 1 million of inhabitants (number) (S) (35)	Municipal waste disposed of in landfills per 1 inhabitant (kg) (D) (49)	Percentage of households with access to broadband internet (%) (S) (58)
Urban population exposure to air pollution by particulate matter (µg/m3 daily) (D) (13)			

Urban population exposure to air pollution by ozone (μg/m^3 daily) (D) (14)	Share of rail and inland waterways transport in total transport: freight transport by rail (%) (S) (36)	Emission of greenhouse gases equivalent (%) 1988=100% (D) (50)	Percentage of persons using the internet to communicate with public administration (%) (S) (59)
Permanent poverty risk (%) (D) (15)			
Rate of permanent poverty or social exclusion risk (%) (D) (16)	Share of rail and inland waterways transport in total transport: freight transport by water (%) (S) (37)		
Income distribution inequalities (%) (D) (17)	Share of rail and inland waterways transport in total transport: passenger transport by rail (%) (S) (38)	Emission of greenhouse gases per unit of consumed energy (%) (D) (51)	Percentage of women in parliament (%) (S) (60)
Adolescents not in education (%) (D) (18)	Productivity of resources (euro/kg) (S) (39)		
Percentage of persons aged 25-64 years with no more than lower secondary education (%) (D) (19)	Organisations with an environmental monitoring and assessment (EMAS) system (number of organisations) (D) (40)	Emission of greenhouse gases per unit of consumed energy (%) (D) (52)	Percentage of women in managerial positions (%) (S) (61)
Percentage of persons in households without employed persons aged 18-59 years (%) (D) (20)	Debt of the sector of government and self-government institutions relative to GDP (%) (D) (41)		
Long-term unemployment rate (%) (D) (21)	Gross Domestic Product transport capacity freight transport (%) (D) (42)	Non-mineral waste generated per capita (kg) (D) (53)	Percentage of women in local governments, mayors (%) (62)
BAEL unemployment rate in total (%) (D) (22)	Gross Domestic Product transport capacity passenger transport (%) (D) (43)		
Gender pay gap (%) (D) (23)	Energy consumption of transport relative to GDP (%) (D) (44)	Municipal waste generated per capita (kg) (D) (54)	Corruption Perception Index (points) (D) (63)
Electric power consumption in a household per 1 resident (GJ) (D) (24)	Rate of economic and social inactivity among adolescents (%) (D) (45)		

* S – stimulant; D – destimulant

Source: own elaboration based on (http://wskaznikizrp.stat.gov.pl/).

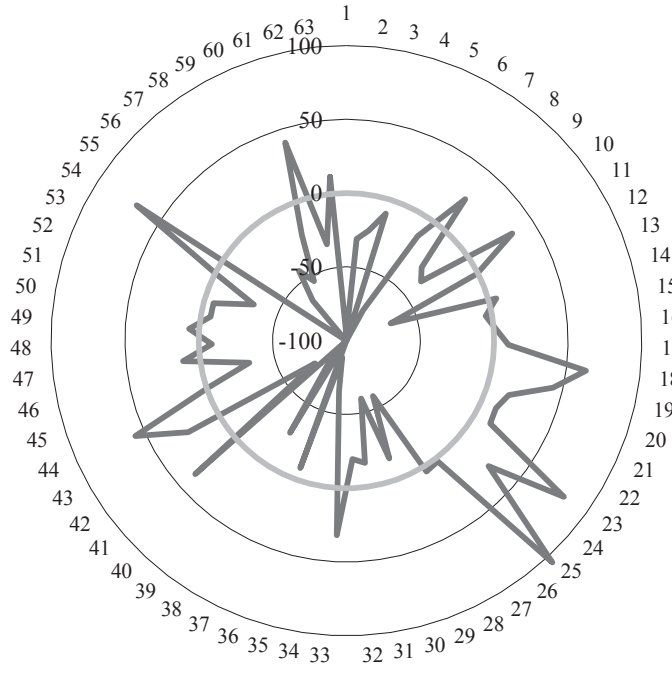

Fig. 1. Indicators of sustainable development in Poland in relation to the European Union

Source: own elaboration based on (http://wskaznikizrp.stat.gov.pl/).

The environmental domain was evaluated with nine indicators (Table 2; Figure 1). The most recent available data originate from 2013. Only three of the analysed indicators scored higher than the EU average in 2013: share of renewable energy in fuel consumption by transport, municipal waste disposed of on landfills per capita and municipal waste generated per capita. The first two indicators demonstrated a substantial increase in the estimated value in Poland: from 30% below the average in 2004 to 11.54% above the average in 2013, and from 9.87% below the average in 2004 to 6.85% above the average in 2013, respectively. Municipal waste generated per capita (a destimulant) scored the lowest in Poland among all EU states in 2004 and, regrettably, since then the generation of waste has increased, hence the estimate for 2013 was over 27 percentage points lower than in 2004.

The assumptions underlying the Europe 2020 Strategy foresee changes in climate and energy use, and presume that carbon dioxide emissions should be reduced by as much as 30%. Unfortunately, greenhouse gas emissions in Poland are high and the score compared to the average per consumed energy unit was about 6.42% above the EU average in 2015. However, some improvement was noted by the 12 percentage point increase relative to the result in 2004. It is worth noting the fact that Poland scored above the average in both analysed years with respect to the indicator GHG

equivalent emissions, and this indicator decreased in value (a destimulant). The indicator identifies total annual emissions of greenhouse gases generated (the Kyoto Basket) relative to the GHG emissions in the base year 1988. What is worrying is that the assessed value of the indicator: share of renewable energy in gross final energy consumption, was not only below the average in 2004 but also fell to 32.46 below the average in 2013.

The institutional and political theme may appear not to have a bearing on the aforementioned overriding goals of the Strategy, but it produces an indirect influence on the conditions in which these targets are being pursued. Among the nine analysed indicators, only two achieved scores above the EU average in both years: share of women in managerial jobs, and index of perceived corruption (Table 2; Figure1).

Sexual equality is now a basic right and a necessary condition for the attainment of sustainable development favouring social inclusion. Economically speaking, an increasing share of women in managerial positions not only affects the quality of management but also means the more efficient use of inputs into education. On the other hand, corruption threatens the proper and efficient functioning of a society in many spheres of public life. It restrains the state's efficiency and is a barrier to sustainable growth.

The assessed value of the Corruption Perception Index for Poland has fallen substantially since 2004, by over 68 percentage points. Five of the analysed indicators in the final research year scored lower than in the first indicator. The lowest score in both years was assigned to the indicator: official development assistance (ODA) to developing countries. This is an indicator which belongs to the sphere of challenges in the scope of global poverty and permanent growth. The EU states should help actively to promote global growth worldwide and ensure that the internal and external policy of the European Union is consistent with the global targets of permanent development and with the international obligations of the European Union.

5. Conclusions

Both hypotheses were verified. From the set of proposed indicators it was possible to choose those which allowed forecasting the achievements of the assumed objectives and monitoring at each stage of task implementation. The most difficult goal to achieve was the financing of research and development. The most difficult to forecast goal was related to climate protection.

The results indicate certain changes in the levels of individual indicators from 2004 to 2015. In Poland not all of the changes were beneficial. However, when analysing indicators it is important to remember that the set goals were different for different countries. The EU has the possibility to reach the target employment of 75% for persons aged 20-64 by the year 2020. This, however, depends on the progress achieved in individual countries. Assuming the current rate of change in this indicator in Poland (0.95% annually on average), the level of 71% is very likely to be achieved.

It needs to be emphasised that Poland now has the lowest values of the indicators describing unemployment over recent years: the unemployment rate and the rate of long-term unemployment, which have decreased dramatically since 2004.

Regarding the assumptions that investment in research and development should equal 3% of GDP, the inputs into R&D were analysed relative to GDP. In Poland the increase in the indicator between the analysed years was 0.45 percentage points, while the average increase in the EU was 0.28 percentage points. As a result, the relation of R&D inputs to GDP was 1% in Poland and 2.03% in the EU. Assuming a similar rate of change in the following years as during the analysed 11-year period, it might be difficult to reach the target in Poland as well as in the whole EU.

According to the assumptions of the strategy, the number of early school leavers should be reduced to 10%, and at least 40% of the young generation should gain tertiary education. In the current study, the relationship was studied between the number of people aged 18-24 years with primary and lower secondary education who do not continue learning at school or further training to the total number of people in the same age brackets. In Poland this indicator scored low in both analysed years, and a decrease since 2004 was noted, which is a positive tendency. In 2015 just 5.3% of adolescents did not continue education in secondary schools. Nonetheless, the level to be achieved by Poland was much lower than that set for the EU. By 2020, Poland should have raised the value of this indicator to 4.5% but, provided the same rate of change as noted in the current research, it may reach a level higher than expected. In the EU this indicator scored 11% as early as in 2015, and therefore it is very likely to decrease to 10% by 2020. Likewise it is highly probable that the other indicator, i.e. share of persons with higher education, will reach the target level. In the EU countries the percentage of college and university graduates among 30-34-year-olds was 38.7% in 2015 (28% in 2005). In Poland this indicator scored 39.1% in 2010 and 39.1% in 2012, rising by 16.4 percentage points since 2005. Assuming the same rate of change, or even a lower one, it is possible to reach the set target for Poland, which is 45%. The strategy assumes that the number of persons at risk of poverty in the EU should be lowered by 20 million. When analysing the progress in individual EU states, and bearing in mind that they are assigned different target levels to achieve, the forecasts made between 2008 and 2014 suggest that the above goal will not be attainable (the reduction achieved in the EU is slightly more than 4 million). In turn, the reduction obtained in Poland surpassed the required level by over 140% (over 2 million).

Regarding the strategy's assumptions on climate and energy, the EU countries appear to be highly heterogeneous. They differ in terms of sources of total energy produced, which is why three principal goals were agreed on to be reached by 2020: a reduction in CO_2 emissions by as much as 30% compared to the level noted in 1990, an increase in the share of energy from renewable resources in the total energy basket of the EU by 20%, and improved energy efficiency by 20%. With respect to greenhouse gases, including CO_2, and energy consumption by the economy, some

improvement can be seen in both the entire EU and in Poland, as there is a decreasing tendency in GHG emissions. Since 2011, a decrease by 16.5% was noted in the EU, and this indicator tended to decrease in value over the years analysed in the current study. Should this trend continue, there is a possibility that the EU countries will reach the set target, although success would require further activities promoting GHG reduction. The task that Poland faces is to increase the share of energy from renewable resources. This is currently a realistic possibility in Poland, as the share of renewable energy was 6.9% in 2004 and increased to 11.3% in 2013, while the share of renewable energy in the transport sector rose from 0.7% in 2004 to 6% in 2013.

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