EU Institute in Japan, Kansai

EUIJ-Kansai
International Seminar on Environment

Project funded by the Eruopean Union

Economic Instruments and Renewable Energy in the European Union

From the experiences of the new EU accession countries

22nd and 25th February 2013

Tokyo-Marunouchi Campus, Kwansei Gakuin University (22nd Feb)
Institute for Industrial Research, Kwansei Gakuin University (25th Feb)

EU Institute in Japan, Kansai (*EUIJ-Kansai*)

International Seminar on Environment

Economic Instruments and Renewable Energy in the European Union

From the experiences of the new EU accession countries

Edited by

Akira ICHIKAWA
Associate Professor, Institute for Industrial Research
Kwansei Gakuin University

EUIJ-Kansai International Seminar on Environment

Economic Instruments and Renewable Energy in the European Union
From the experiences of the new EU accession countries

Date	22nd and 25th February 2013
Venue	Tokyo-Marunouchi Campus, Kwansei Gakuin University(22nd Feb)
	Institute for Industrial Research, Kwansei Gakuin University(25th Feb)
Organizer	EU Institute in Japan, Kansai (*EUIJ-Kansai*)
Co-host	Institute for Industrial Research, Kwansei Gakuin University

The Report on *EUIJ-Kansai* International Seminar on Environment
"Economic Instruments and Renewable Energy in the European Union
From the experiences of the new EU accession countries"

31st May 2013
Edited by Akira ICHIKAWA

Publisher
Institute for Industrial Research, Kwansei Gakuin University
1-155 Uegahara Ichibancho, Nishinomiya, Hyogo 662-8501 Japan
Tel +81-(0)798-54-6127
Fax +81-(0)798-54-6029
E-mail: euij-kansai@kwansei.ac.jp

Forward

It has been said that the European Union has acted as the environmental leader in international environmental negotiations, including those on climate change. Particularly since the Treaty of Lisbon the EU has also spoken to the rest of the world with one voice on these issues.

But in the European Union there are some Member States that are environmental leader countries such as Sweden, Austria, Denmark and Germany, and others that can be called “environmental laggards” such as the central and eastern European countries and southern European countries. Most of the new European Union Member States in particular have had a lower degree of the economic development than the EU15 countries and greater difficulty implementing the European Union’s environmental laws and policies.

The European Union has put forward the so-called “20-20-20 Strategy”, under which it will reduce greenhouse gas emissions by 20% compared with 1990 levels, improve energy efficiency by 20% and increase the ratio of the renewable energy in the primary energy supply to 20% by 2020. Furthermore, in the "Energy Roadmap 2050" discussion, the European Union has advocated a long-term goal of reducing greenhouse gas emissions by 2050 by 80-90% compared to 1990 levels. How are the EU’s ambitious policies toward a low-carbon society seen in Poland, a member state whose energy mix is heavily based towards traditional fossil fuel sources?

In this environmental seminar, the EU Institute in Japan, Kansai, invited Professor Kazimierz Górka of the School of Industrial and Environmental Policy, Cracow University of Economics, to present his views about the environment and energy policies of the European Union and its future prospects.

Professor Górka gave two lectures, entitled “The Application and Economic Efficiency of Renewable Energy Sources in Europe” and “The Instruments of Environmental Policy in Poland against the Background of the EU Economic

Policy". I would like to extend my heartfelt appreciation to Professor Kazimierz Górka, and also to the many individuals who participated in and supported these events.

Takayuki Yamaguchi
Vice-president, EU Institute in Japan, Kansai
Professor, School of Business Administration
Kwansei Gakuin University

EU Institute in Japan, Kansai (*EUIJ-Kansai*)

International Seminar on Environment

Economic Instruments and Renewable Energy in the European Union

From the experiences of the new EU accession countries

Contents

Forward…… p.3

Takayuki Yamaguchi

Vice-president EU Institute in Japan, Kansai

Professor, School of Business Administration, Kwansei Gakuin University

The Application and Economic Efficiency of Renewable Energy Sources in Europe…… p.6

Kazimierz Górka

Professor Emeritus, Cracow University of Economics

Department of Industrial and Environmental Policy

The Instruments of Environmental Policy in Poland against the Background of the EU Economic Policy…… p.15

Kazimierz Górka

Professor Emeritus, Cracow University of Economics

Department of Industrial and Environmental Policy

Lecture's Profile…… p.29

Kazimierz Górka
Cracow University of Economics, Poland
Department of Industrial and Environmental Policy

THE APPLICATION AND ECONOMIC EFFICIENCY OF RENEWABLE ENERGY SOURCES IN EUROPE

Once the management of energy by Man was based on renewable resources. The industrial revolution, and particularly the development of metallurgy, and then of transportation led to a dynamic increase in the use of fossil fuels. Also, they proved more convenient for the use of municipal economy. Currently we are witnessing a return to the extensive use of biomass, as well as exploration of new technologies making use of wind power, solar energy, and other renewable resources.

The prospects for the more common use of renewable energy sources depend on such factors as purposefulness, efficiency and economic profitability of their use.

The purposefulness of use of those resources is defined by the demand for energy. Apparently, the demand for energy is rapidly increasing. Until recently, it was relatively easy to prove that the consumption of energy and fuels was growing at a faster pace than the pace of industrial production, or even the rate of growth of the GDP. Those relations were changed by the technical progress and the pursuit of lowering the energy consumption in industrial processes. The only examples of faster growth of electric energy consumption are to be found in selected production processes, in particular in services. Purposefulness of using the renewable resources is advocated more and more forcefully in view of the shrinking resources of classic fossil fuels.

Even though the forecasted imminent running out of oil deposits, the mantra preached from the late 1940s , or the assessment of deposits included in the Club of Rome Report titled “The limits to growth” of 1972 were proved wrong, it is obvious that the deposits of fossil fuels are not unlimited. Currently we can observe the increasing costs of extraction due to the

necessity to reach for the less accessible deposits, or those with the smaller content of the resource. That is why the importance of renewable resources is growing in view of the finite deposits and non-renewable character of the fossil fuels.

Another aspect advocating the increased use of renewable energy sources is the ecological aspect; they are not noxious to the environment. That is because renewable energy resources involve very low emissions, if any, in the process of their use. In times of preventing the global warming, improving health conditions and protecting life, that argument is more and more decisive in programming the growth of use of renewable energy resources.

The efficiency of use of renewable resources , that is the extent to which the objectives set for energy supply are met, varies and it depends on the kind and form of generated energy. To give an example, the use of water energy, and wind energy in particular, are dependent on the weather and atmospheric conditions, which are not easy to forecast. Technical progress does not always improve the efficiency of equipment used for generation of the power.

Economic efficiency, i.e. profitability of power generation from renewable resources mostly proves adverse from the microeconomic angle, in other words, in the financial terms perceived by a private investor. That is because the electric power delivered by large water power plants – with the exception of those located in the mountainous areas - as well as the power generated by wind turbines, or solar cells is usually more expensive than that produced by the traditional power plants fired by fossil fuels. High capital investment involved in such plants and the transmission network – particularly from the wind farms on the seas – and worse use made of the nominal working hours are the decisive factors.

That is why the state, having considered the macroeconomic calculation, and taking into account the social and environmental factors, is trying to support with subsidies, tax breaks and other preference tools the producers of energy from renewable resources. In some European states, e.g. Germany and Poland, the producers of energy from renewable resources have priority in

selling energy at favourable rates. Also the distributors are obliged to purchase such energy at fixed prices. Finally, the average cost of electric energy delivered to the consumers connected to the state network is calculated on the basis of the cost of generation and sale of all producers included in such a system. In this way the consumers of electric energy cover the varied costs and guarantee profit to all producers.

As we all know too well, the world is using more and more energy. It is quite difficult to imagine the sheer volumes of fuels that are actually used. In 2010 alone the world economy used about 20,3 trillion tonne of fossil fuels (in conversion to coal equivalent). Consumption of hard coal amounts to staggering 75% of total consumption, lignite 5.1%, oil 17.8%, and natural gas 0.6%. The extraction of those fuels is still growing, even though they are extracted in more and more difficult conditions. Extraction of natural gas is growing the fastest. Within 2000 – 2010 that growth amounted to 21.3%, and coal with 18.5 % came second. However, most coal mines were shut down in Western Europe, and that part of the world uses either its own, or imported oil and gas. The European Union has been quite successful at implementing the program of development of renewable energy sources, and an energy saving program.

Table 1. The structure of energy consumption in Poland within 2000 - 2020

Specification	Consumption in terajoules[a)]		2010/2000	Structure in %		
	2000	2010		2000	2010	change
Hard coal	1940687	2007947	103,5	50,4	45,9	-4,5
Lignite	507526	484708	95,5	13,2	11,0	-2,2
Coal and lignite total	2448213	2492655	101,8	63,6	56,9	-6,7
Oil	768502	970635	126,3	20,0	22,2	+2,2
Natural gas	452713	584375	129,1	11,8	13,3	+1,5
Peat and wood	123405	180274	146,1	3,2	4,1	+0,9
Other renewable resources	7723	18054	233,8	0,2	0,4	+0,2
Waste fuels and others	47047	132343	281,3	1,2	3,1	+1,9
Total	3847603	4378336	113,8	100	100	-

a) 1 jule = 0.239 calories, terajule (TJ) = 10^{12} jules
Source: Author's own on the basis of Environmental protection, Main Census Office, Warsaw, 2011, p. 224.

Table 2. Production of primary energy in the EU in thousand toe

Specification[a)]	2000	2009	2009/2000	Structure in %	
				2000	2009
Total (UE-27)	940 822	812 221	86,3	100	100
Great Britain	269 780	156 334	58,0	28,7	19,2
France	129 426	128 478	99,3	13,8	15,8
Germany	135 383	127 454	94,1	14,4	15,7
Poland	78 985	67 212	85,1	8,4	8,3
Spain	31 509	29 579	93,9	3,3	3,6
5 countries	645 083	509 057	78,9	68,6	62,6

a) toe – tonne of oil equivalent = 41,868 GJ or 11,63 MWh
Source: The same as for Table 1.

Table 3. The share of energy produced from renewable resources in the final gross consumption of energy in the selected states of the EU (in %)

Country	The share of energy from renewable resources		Target share of energy from renewable resources in 2020
	in 2005	in 2009	
Great Britain	1.3	3,0	15
Belgium	2.2	3,9	13
Netherlands	2.4	3,9	14
Irleland	3.1	..	16
Germany	5.8	8,5	18
Poland	7.2	7,5	15
Spain	8.7	9,3	20
France	10.3	12,0	23
Denmark	17.0	17,0	30
Romania	17.8	19,0	24
Estonia	18.0	18,0	25
Portugal	20.5	..	31
Finland	28.8	..	38
Latvia	32.6	36,2	40
Sweden	39.8	41,0	49

a) EU-27 in 2009 about 9%.
Source: Directive 2009/28/WE on the use of energy from renewable resources. "The Journal of the EU" " L 140/16 PL, 5.6.2009

Poland and other Central European countries (the Czech Republic, the Slovak Republic, Hungary, Bulgaria and Greece) have encountered considerable difficulties in that area due to different climatic conditions, and mostly because of their heavy reliance on coal in power generation. The above mentioned countries emit 0.75 – 0.9 tonne CO_2 / MWh, while France or Sweden below 0.1 tonne CO_2/ MWh. Poland seems to be in a peculiar situation; even though it reduced mining of coal from 200 million tonne to less than 65 million tonne annually, yet almost 90% of electric power generation is based on coal and lignite.

Table 4. Production of renewable energy by sources in the EU in thousand toe

Specification[a)]	2000	2010	2010/2009	Structure in %	
				2000	2010
From biomass and waste incineration	59 194	112 725	190,4	61,3	67,6
Geothermal	4 714	5 881	124,8	4,9	3,5
Hydro	30 312	31 492	103,9	31,4	18,9
Wind	1 913	12 817	670,0	2,0	7,7
Solar	430	3 886	903,7	0,4	2,3
Total	96 563	166 801	172,7	100	100

a) toe – tonne of oil equivalent.
Source: The same as for Table 1.

Poland's population amounts to 38.2 million, which is 7.6% of the European Union. The consumption of energy in 2010 amounted to 60.9 million tonne of oil equivalent, i.e. mere 5.5% of energy consumption in the EU (1597 kg/inhabitant, i.e. 71.8% of the EU volume which amounts to 2225 kg). Yet, Poland emits staggering 8.3% of greenhouse gases released in the EU (383.2 million tonne versus 4614.5 tonne of CO_2 equivalent). This is the result of burning coal in power plants and households.

One of the indexes of social and economic development, apart from GDP, has been the consumption of power per capita. There has been a great variety in the value of that index in the world, and its growth rate has been high. To be more specific, within 1995 – 2010 the consumption of electric power grew by 26.8% (to 2996 kWh in 2010). In the North and Central America it grew by 5.2% (to 10082 kWh), in Europe by 20.9% (to 6749%), and in Asia to staggering 77.9% (to 1966 kWh). To give a comparison, Poland reached 4 129 kWh in 2010 in the consumption of power, while Japan consumed 7 296 kWh in the same year. It is worth mentioning that the progress in the use of renewables is due to their direct application in power generation.

There has been a great change in the environmental policy of the EU in terms of the preferred structure of renewable energy resources. There has been a retreat from biomass produced from energy plants (the only exception being wood waste). Poland and other countries (following the example set by

Brazil that turned to using sugar cane to produce methanol) started plantations of rape to produce diesel fuel, and other plants to produce methanol added to petrol, as well as "energy willow" as an additive to coal in coal fired power plants.

Table 5. Production of renewable energy by sources in Poland in thousand toe

Specification[a)]	2000	2010	2010/2000	Structure in %	
				2000	2010
From biomass and waste incineration	3 624	6 439	177,7	95,2	94,0
Geothermal	3	14	466,7	0,1	0,2
Hydro	181	251	138,7	4,7	3,7
Wind	0	143	x	-	2,1
Solar	0	2	x	-	0,03
Total	3 808	6 849	179,9	100	100

Source: The same as for Table 1.

In this way the share of renewable energy resources is growing in transportation and power generation with the resultant improvement of economic indexes. Nevertheless, such a policy leads to monoculture in farm production and decreases production of food. That issue has been raised by Poland and other EU member states since the onset of ecology-oriented policy, and finally the EU took a different stance.

As it has been already noted, the attention paid to renewable energy resources is dictated not only due to the limited resources of fossil fuels, but also due to the greenhouse effect. The latter still raises much controversy, since it remains to be seen how much the economy and burning fuels are to be blamed for it (according to some estimates, they jointly account for 1% of greenhouse gases), and how much some other factors such as volcano eruptions, natural changes of air circulation and the impact of the outer space. The Report of the Intergovernmental Panel on Climate Change (IPCC) prepared in the last few months, to be published in 2014, informs that the temperature of Earth has been rising slower than initially assessed. Within 1990 – 2012 according to the UN the temperature rose only by 0.15 °C (not by 0.5 °C). Nevertheless, an increase of 0.1 °C is already significant. Taking an example of Kraków, Poland, over the past 200 years

the winter temperature rose by 2 °C, and the summer season temperature increased by 0.3 °C.

Climate Policy of the EU, and also the UN initiatives such as the Kyoto Protocol have been based on IPCC materials. The results of that policy make a major impact on the economy. Stepping up regulations on burning coal would pose a serious threat for Poland. In line with enforcing more stringent directives, the price of electric power would go up a few dozen per cent, and many people would be made redundant. That in turn would cause an economic downturn. Hence, the comments in Polish and foreign press point to IPCC hoax as the cause of those problems. Nonetheless, Poland has noted the first success in that area once the Energy Commission of the European Parliament (on our motion) agreed to remove a part of CO_2 emissions permits (the so called backloading), which should curb rising prices of those permits. Initially the prices were rising, yet over the past two years they dropped from 15 to 5 euro/tonne CO_2. According to the EU, such situation does not stimulate the improvements in the technology of electric power generation (hence the decision to cancel some emission permits). However, on recommendation of envirinmental organizations, the European Parliament wants to go back to that issue. Consequently, the power generation sector voice their concerns that the number of permits for CO_2 emissions may be reduced in the near future. In February 2013 it was supported by the Environment Commission of the EP.

Polish power plants have been receiving a part (75%) of those permits free of charge, and they have been purchasing the rest on the market (the exchange). In 2013, the power plants will have to purchase emission permits for 1.3 billion PLN (3.2 billion euro).

Much controversy has been raised by the environmental projects to build industrial installations for carbon capture and storage. There is much doubt on the efficiency, and recently on the profitability of those projects. The cost of installation amounts to 60 euro/tonne, and the emission permit cost is 5 euro/tonne CO_2 .

The EU is accountable for mere 10% of the global CO_2 emission. Nevertheless, it assumed a new target to reduce by 2020 the emission of CO_2 by 20% of what it was in 1990. Should other countries pledge the same, then the EU declares to go to 30%. China, India and the USA, whose emissions are the largest, do not wish any formal limitations so as not to make their economies less competitive, as well as to prevent relocation of most energy consuming branches of industry to other countries.

In addition, the EU directives require increasing energy efficiency (lowering energy consumption by industry and services) by 20%, and increasing the share of renewables in final gross energy consumption to 20%, including 10% share of biofuels for transportation (petrol and diesel fuel). Each country is expected to draw up their plan of action and reach the set objectives.

The 3 x 20 rule sounds plausible and is by all means opportune, especially in the area of renewable energy resources and increasing energy efficiency. Yet, drastic cuts in CO_2 emissions seem to be too expensive for some countries (within such a short time), and on global scale little effective.

Bibliography

1. Blue Book on Geothermal Resources. Office for Official Publications of the European Communities, Luxembourg 1999.
2. Energy: Issues, Options and Technologies. Science and Society. European Commission, Brussels 2002.
3. European Energy to 2020. A Scenario Approach. European Commission, Luxembourg 1996.
4. European Energy and Transport Trends to 2030. European Commission, Luxembourg 2003.
5. European Union Energy Outlook to 2020. European Commission, Luxembourg 1999.
6. Europe in figures. Eurostat Yearbook 2012. European Commission, Luxembourg 2012.
7. Europe's energy position. Market Observatory for Energy, Luxembourg 2011.
8. E. U. energy trends to 2030. European Commission, Luxembourg 2010.

9. Wind Energy. The Facts. Office for Official Publications of the European Communities, Luxembourg 1999.
10. World and European Energy and Environment Transition Outlook. Publications Office of the E. U., Luxembourg 2011.

Kazimierz Górka
Cracow University of Economics, Poland
Department of Industrial and Environmental Policy

THE INSTRUMENTS OF ENVIRONMENTAL POLICY IN POLAND AGAINST THE BACKGROUND OF THE EU ECONOMIC POLICY

1. Poland within the framework of the European Union

On the global scale, Poland belongs to the group of small countries: 0.2% of global area (by which Poland ranks 68th), 0.6% of global population (34th positions), 1.3% of global trade (27th position in 2000 and 18th in 2010), 0.9% of global GDP (18the position). However, in Europe Poland is considered to be a medium-sized country; 1.4% of area (9th position), 5.2% of population (8th position), 3.3 % of foreign trade (10th position) and 2.5% of European GDP (8th position).

In comparison to Japan, Poland is a slightly smaller country. The area of Poland is 312.7 thousand sq.km, whilst Japan has 377.9 thousand sq.km.. Populations of both countries are 38.2 million and 127.3 million, respectively, hence population density is 123 and 337 people/sq.km., respectively. Nevertheless, the differences in economic development decisively show Japan's upper hand: 34 013 USD of GDP per capita in the face of 19 752 USD in Poland.

Poland joined the EU in 2004. It occupies 7.1% of the EU area and has 7.6% of its population. Owing to the political and economic changes of the 1990s, followed by opening its borders to western countries, taking advantage of the free market, and making use of the EU structural and cohesion funds, Poland managed to avoid the economic recession of 2008 – 2010 , and has been developing at a relatively fast pace (GDP growth usually 2 – 3 points above the EU average). Due to this, the national income in Poland measured with the use of GDP index based on buying power parity increased from 11.5 thou euro to 15.2 thou. euro within 2005 – 2010 timeframe, which translates into an increase of 32%. In other words, the national income grew from 51% to 62% of average EU GDP (compared to U-16, i.e. the "old" EU

member states, it grew to 56%). That trend has been sustained as the Polish rate of growth is higher than the EU rate, despite the slowdown of recent years (4.3% in 2011, 2% in 2012, forecasted 1.5% for 2013)

The economic growth in Poland is largely based on the changes within the sectors of national economy, which are aimed at increasing the share of services in generating GDP (Table 1), as well as increasing the share of machine tool industry, electronic industry and plastics industry within total industrial production. In terms of professional activity index, Poland does not have such a strong position (about 55% of population are 15 years old, and older) and the employment index, i.e. the figure representing the currently employed (50.4%, and 64% for people aged 20 – 64, compared to 69 – 70% in western countries). Even greater difference can be observed in R&D investment (0.6 – 0.7% compared to 1.9 – 2% average in the EU). The same differences can be noted in rankings of innovativeness and entrepreneurship. In terms of ease of conducting an economic activity, Poland ranks 60th in the world, and in the category of competitiveness of enterprises 30 – 45 (depending on the method of assessment; over 150 countries were covered). Poland takes much higher position in terms of standards of education, social welfare and life expectancy. In terms of the standard of living of its citizens, Poland ranks 30 – 33. It should be noted that Poland belongs to the countries with the most dynamically growing indexes.

Table 1. Changes in the structure of employment and generation of added value in %

Sectors of economy	Employment		Generation of GDP	
	2005	2010	2005	2010
Farming and forestry	17,4	12,8	4,5	3,5
Industry and construction	29,2	30,3	30,8	31,7
Services	53,4	56,9	64,7[a)]	64,8[a)]
Total	100	100	100	100

a) Including non-market services 14.9% oraz 14.7%.

Source: Annual Census Book. GUS, Warszawa 2011 , and Author's own calculations

Table 2. Basic indexes of the economic situation in Poland within 2005-2010

Specification (current prices a))	2005	2009	2010	Dynamics 2005-2010 fixed prices
GDP in billion PLN	983,3	1343,7	1415,4	125,9
Investment in billion PLN	131,1	218,6	216,0	152,9
Industrial sold production in billion PLN	687,8	896,4	1010,3	133,9
Construction and assembly in billion PLN	89,5	154,4	160,0	154,5
Export in billion euro	71,4	98,2	120,4	..
Turnover balance in billion euro	- 9,8	- 9,3	- 13,8	140,8
Balance of payments in % of GDP	- 2,4	-3,9	- 4,5	187,5
Employment in economy, million of people b)	12,73	13,77	13,83	108,6
Employment, million of people	8,79	9,77	9,83	111,8
Number of unemployed at the end of the year, million of people	2,77	1,89	1,95	70,4
Unemployment rate, %	17,6	11,9 c)	12,3	69,9
Average pay in PLN	2361	3102	3225	120,9
- in corporate sector	2516	3325	3435	138,5
Budgetary deficit in billion PLN	28,4	23,8	44,6	157,0
- in per cent of GDP	2.9	1.8	3.2	110.3

a) 1 zł = approx. 0.24 euro. b) Including farmers. c) According to Eurostat 9.6%.

Source: The same as for Table 1.

2. The reasons for the crisis and the ways of overcoming it

After a period of extensive economic growth and social development following World War II, excluding the oil crisis of 1973 (which was more attributable to supply problem than dwindling resources or a drop in extraction), the USA and Western Europe experienced a small recession in 1992, and then 2000 – 2002. Nevertheless, the financial, and then economic crisis erupted in 2007 first in the US, then in the countries of Western Europe, and beyond. The financial crisis was caused first of all, as we know too well, a spree of sub-prime loans lavishly granted by the American banks, and the consequent burst of the "housing bubble" on the property market. The echoes of that crisis, though much weaker, were also noted in Poland. Commercial banks granted many bad loans, and investment banks converted that debt into toxic derivatives, based on debatable value of the underlying assets. Hence, paper money became the reason for the crisis. Its value was based on the trust in the financial run of game which became bent in pursuit of profits. The thesis of Paul H.Dembinski (a Pole living in Switzerland) has become the bottom line of criticism of the model of economy dominated by capital. He described the phenomenon of *finacialization* of

contemporary capitalism, i.e. the dominance of financial spheres over the world of real economy.

On the side, it is worth mentioning that the recession is continuing and, according to many economists, it is turning into a "depression with no end", the economic growth is almost non-existent, and there are no signs of improvement. Hence, it is not a crisis resulting from the classical cycle of the market economy, but it reminds of a relatively little researched, long cycle defined by Kondratiew in the 1930s, recurring every 50 years.

Returning to the roots of the crisis, it seems that the economic policy of many a government which led to the excessive budgetary deficit and public debt, became a significant factor that contributed to the financial collapse. The difficulties have been further exacerbated by the ageing societies and the growing number, in relative and absolute terms, of retirees, enforcing increased budgetary outlays allocated to the social security fund. The reasons for the crisis also include exhaustion of a limited reserve of increased productivity, workers qualifications, or even innovativeness (excluding pseudo-innovativeness for the purposes of promotion and advertising).

There has been a new tendency to put more and more blame for the crisis on financiers and managers of large corporations. They were blamed not for the wrong decisions they made and incorrect assessment of risk, but for being dishonest and greedy. Speculation in financial services distorted the principle of maximizing shareholders value, and – along with other factors – increased disproportions in incomes to the level that is hazardous to the economy and not accepted by the society.

All this has resulted in – during efforts that have been made since 2009 to overcome the crisis – abandoning the neoliberal concepts and adopting a new version of Keynes' theory in the economic policy. In this way, due to concerted, almost of global proportions public intervention, many banks and corporations were bailed out, preventing another great economic crisis. In this way macroeconomic instruments of the economic policy of the state have been strengthened, most likely for the years to come.

In Europe, the governments of Great Britain and Germany bailed out the banks and automotive concerns. Nevertheless, the EU has been riddled with problems in negotiating long-term financial framework due to at least two distinctive economic cultures, i.e. German macroeconomic discipline based on the European Central Bank with its package of stabilization and growth, and the British liberalization expressing preference for the common commodity market, services, labour and capital, yet without strict financial oversight.

In Poland, a new form of state intervention was launched with the establishment of a new partnership Polish Development Investment. This is a SPV (Special Purpose Vehicle) with equity of 10 billion PLN (approx. 2.5 billion euro) allocated from the state treasury. The expenses of the partnership shall not encumber the budget, hence shall not increase its deficit. The partnership, in conjunction with the state bank "Bank Gospodarstwa Krajowego", shall finance a project "Polish Investment", mainly in the area of infrastructure, e.g. highways and expressways, as well as a railway and power projects to boost economic development and cut down unemployment.

3. The challenges of the 21st century in view of the global, and the EU issues

Following 2000, a dozen documents was prepared in Poland presenting the programs of social and economic development up to the year 2020, 2030, or even 2050. The programs were drafted on the basis of the already formulated, or newly set objectives of industrial policy, power, ecological, regional and social policies, and especially on the directives and recommendations of the EU. The financial crisis and its consequences, which also affected Poland, advocate reconsidering those long term forecasts and projects. To make them credible it is prerequisite to reconcile current economic issues which were formulated earlier, and which impact further development. Those issues have not found any political settlement due to the weakening of government elites and the ongoing disputes. To this day there exists, or is becoming even stronger the domination of branch and corporate relationships (e.g. excessive benefits for miners or teachers), public sphere lagging behind the expansion of the private sector (e.g. problems with IT systems in central and local

government administration), inflation of the law, or in other words, a shower of low quality legal acts. This process is accompanied by the growing populism propagated not only by "Law and Justice" political party, but also by other parties and groups, thus hindering the development of civil society and implementation of necessary economic reforms. Consequently, the progress of economic and social policy may become a decisive factor in successful coping with the civilization challenges of the 21st century.

The extensive report "Poland 2030. Development challenges" presented by Prime Minister Donald Tusk in 2009 has become one of major program documents. It lists ten most important strategic issues:

- economic growth and competitiveness,
- demographic situation (the falling birth rate),
- increasing professional activity and flexibility of human resources (also fighting unemployment, especially among young and educated people),
- appropriate potential of technical and social infrastructure,
- energy and climatic safety,
- economy based on knowledge and development of intellectual capital,
- solidarity and regional cohesion,
- improved social cohesion (social inclusion and supporting citizen rights),
- efficient state,
- growth of social capital.

Critical comments that were made about that document pertain to the insufficient exposure of ecological issues in light of sustainable and sustained social and economic development, including stimulation of natural environment preservation. In addition, it did not tackle the implementation of the so-called green tax reform which stipulated shifting taxes, proceeds from revenues and social security to the consumption of resources and energy and the emission of pollutants.

Crucial national problems still include – despite implementation of the system reform – the shaping of political, economic and social systems. Although the Constitution of the Polish Republic stipulates *social market economy* based on economic freedom, private property, social consultation and solidarity to be the economic system of our country, yet there are many

issues in need of development, such as full deregulation (liberalization) of other sectors of the economy, decentralization of management, stabilization and freeing from political influence of civil service, concluding the reform of social security and health protection, of the system of education and learning, restructuring of public finance. Hence, there are numerous problems to be solved under the slogans of liberal and democratic system, and the system of market economy.

In addition, the market cannot cope with social and environmental problems. Hence a new concept of the Third Way was devised, which advocates a new reform of social capitalism opposing the Anglo -Saxon capitalism, or even the social-democratic variant of the third way authored by Tony Blair.

More and more economists reluctantly concede, after initial doubts, that socialist principles work better in social life than the rules of capitalism (opposite to the economic practice). That is because socialism is an ideal substantiated on moral grounds, yet it is not feasible in practice due to the mechanisms of the market and human egoism. According to Gerard Cohen, the biggest obstacle is the lack of mechanisms that would allow to exploit the inherent human magnanimity. On balance, the model of social market economy needs further improvement.

Polish accession to the European Union poses challenges that involve reaching an appropriate position, so that our country would not be a part of the so-called two- speed Europe (we are against such division), as well as securing the EU subsidies for the period 2014-2020 and 2020 – 2030. According to optimistic forecasts, the EU subsidies may facilitate Poland's nearing the average EU wealth standards already within 2020 – 2021 (some forecasts peg that GDP level to be reached in 2040). Another objective set for Poland is joining the euro zone, despite growing social protests, which may subside once that currency strengthens.

In the first place, Poland must cope with the budgetary deficit, public debt and inflation (recently it has visibly dropped). Polish authorities are making best efforts, with the support of the EU, to ensure security of energy supplies (the support is apparent in negotiations with Russia on the supply and prices

of oil and natural gas). To date, the support has not been very effective, even though Western Europe also relies on imports of those fossil fuels. Poland does not have definite programs of fracking shale gas due to the still on-going assessment of the existing resources, and the inherent technological and ecological issues. In addition, so far we have not elaborated a final concept for the construction of a nuclear plant, which raised critical expert opinion and social protests.

The European Union treats the environmental protection as an essential element of its economic policy and a factor of social-economic development. For that reason the environmental policy has a vital role to play in paying more attention to the limits of natural resources as well as the needs of future generations. The European Commission has presented Roadmap to a Resource-efficient Europe. It has assumed a new ambitious target to reduce by 2020 the emission of CO_2 by 20% or even 30% of what it was in 1990, and first of all to diminish total energy consumption by 20%. The first target is especially difficult to reach by some countries, e.g. like Poland. Moreover, the dialogue is continuing with member states on greening tax systems and excluding environmentally harmful subsidies.

The Environment Directorate-General in the European Commission was set up in 1973 to protect, preserve and improve Europe's environment for present and future generations. There are four major priority areas:
- natural resources and health,
- environment and health,
- nature and biodiversity,
- climate change.

In this field of nature and biodiversity a big European success has been the creation of "The Natura 2000" network of protected areas encompassing 18% of the territorial space of the European Union.

The 6th and 7th Environment Action Programmes reflect the findings of the European Environmental Agency Report "The European Environment – state and outlook". Among various UE documents we can find some following important directives and programmes:

– Impact Assessment Directives,
– Biodiversity Strategy,
– Multiannual Financial Framework,
– International governance on environmental affairs,
– European 2020 Strategy for smart, sustainable and inclusive growth,
– Comprehensive indexes of development (GDP and others).

4. Changes within the environmental policy in Poland

Within the 1970s and the 1980s, the ecological policy in Poland consisted mostly in environmental protection programs that stipulated detailed investment objectives within environmental protection area and the outlays allocated from the budget, as well as other subsidies (that was characteristic under the central economy system). At that time, there was created an elaborate system of economic instruments for the environmental protection including, first of all, numerous charges and fines for the emission of pollutants, the use of natural environment and making changes in it (dumping waste, cutting trees and shrubs). Those charges and fines were transferred to earmarked ecological funds such as the national fund, voivodship funds, county and gmina funds for the protection of the natural environment and water resources management.

Following the changes of the political system, it was decided to replace those programs with a state issued document "State environmental policy" passed by the Parliament, and amended every five years, particularly the executive acts (as a supplement to the document). That document sets out the objectives for the environmental protection and the instruments for their implementation (rarely listing the important individual tasks). The implementation of the EU directives has been attributed a major role in enforcing the ecological policy.

The current system of economic instruments based on numerous, and relatively high, charges for the emissions has been sustained (to be included in the costs of parties remitting them) as well as the relatively low fines for breaching environmental laws (charged to the P&L Account). It has been ascertained that the Western countries favour ecological taxes, not charges, and that is why the EU was initially advocating changes to be made in this

area in Poland. However, following an analysis and Polish comment it was decided to consider the Central European solution as a proper one; it was even set as an example to be followed by other countries. After 2000 there was a significant increase in the charges for storing waste, while other charges were merely indexed to the inflation rate. Following the example of other western countries Poland introduced product charges, nevertheless most revenue to date has been generated by a new charge levied on the manufacturers and dealers of cars for the absence of a recycling system of condemned cars.

Environmental funds allowed to finance as much as 40% of investment outlays on environmental protection in Poland within 1991 – 1995. Consequently, those outlays grew from the initial 0.3% of GDP to over 1% of GDP (comparable to countries of western Europe). Presently those funds seem to have lost some significance (13 – 18% of investment outlays) and financing has been shifted to enterprise resources. National and voivodship funds have the registered status of artificial person, and they grant subsidies and low interest loans earmarked for environmental projects, while the county and gmina funds were included in the budgets of those local government entities in 2010.

Table 3. The structure of investment outlays on environmental protection in Poland (in %)

Specification	2006	2009	2010	2011
Sewage management and water protection	57.3	66.7	69.4	55.5
Protection of air and climate	26.2	19.8	20.2	25.8
Waste management, soil protection	10.5	9.1	9.0	7.6
Biodiversity and landscape protection	0.2	0.1	0.2	0.3
Decreasing noise and vibration	1.1	0.7	1.2	1.5
Protection against ion radiation	0.01	0.01	0.01	0.1
Unaccounted for expenditure approx 4.5% in 2011 9.2%	100	100	100	100

Source: Environmental protection, Main Census Office, Warszawa 2011, pp 402 and 404.

Currently, the outlays allocated to environment al protection in Poland amount to 46 billion PLN (about 11 billion euro), i.e. 3.5 – 4.5% of GDP. That sum is broken down into investment outlays (24%), current costs (maintenance costs of protection facilities, 25%), household expenses (51%).

The investment outlays grew from 10.9 billion PLN in 2010 to 12.2 billion PLN in 2011 (almost 3 billion euro), while the required sum amounts to 15 billion PLN p.a. The structure of investment outlays on environmental protection is shown in Tables 3 and 4.

Table 4 Structure of investment outlays on environmental protection by the source of financing (in %)

Specification	2006	2009	2010	2011
1.Gmina and enterprises own resources; gmina 15 – 17%, industry 80 – 90%	45.5	46.0	44.2	47.7
2. Environmental funds (1991-95 approx 40%, 1999-2005 approx 21-25%)	17.6	18.3	13.9	12.7
3. Credit and loans, mainly granted by banks	11.4	9.4	13.8	7.0
4. Budgetary resources, mainly gmina, state budget, mainly in 2011	2.75	3.1	3.6	10.2
5. Foreign resources (1991-2000 approx 3%, 2004. 12,2%)	19.2	18.9	22.0	18.5
6. Other unaccounted for	3.6	4.3	2.5	3.9
Total	100	100	100	100

Source: The same as for Table 3.

It might be ascertained that Poland has shown a satisfactory level of adherence to the EU ecological directives. Following Poland's accession to the EU, the Polish government has negotiated an additional 3-7 year transition period to fulfill some obligations. Most noxious industrial plants have been either shut down, or restricted and modified. Once the list of such plants included over 500, then 80, and finally such ranking was abandoned. Nevertheless, the EU has been introducing more and more stringent controls. Hence there are some difficulties in adjusting to new standards within management and disposal of toxic waste.

The biggest challenge ahead of the industrial, energy and environmental policy of the state seems to be the modernization of the power generation industry, which is based in Poland on coal (90%). Such power plants emit large volume of sulphur dioxide, carbon dioxide, and other pollutants.

Poland has had significant success in the reduction of CO_2 emissions, more than satisfying the stipulations of the Kyoto Protocol on the reduction of

greenhouse gases, the cause of global warming. Due to this Poland has profited from selling the greenhouse gases emissions rights. Nevertheless, the ambitious plans of the EU regarding reducing emissions by further 20% by 2020 (and by 80% by 2050) put Poland in a difficult situation as it spells accelerating costly investment in power generation industry and purchasing additional emission rights. That in turn will substantially increase the cost of power generation, and may hinder economic development.

In line with the modernization of coal fired power plants, attempts have been made to supplement power plant fuels with natural gas and biomass (willow wood and wood refuse) Poland is also implementing the program of construction of small water power plants (water resources in Poland are not abundant), and quite recently the wind turbines. Power saving programs are gaining momentum, particularly within the housing sector, In turn, public facilities should need negligible volume of energy after 2019.

Table 5. Emmission of carbon dioxide in the European Union in tonnes per capita

Specification	2000	2005	2009	$\frac{2009}{2000}$
UE – 27	8,5	8,6	7,5	88,2
Czech Republic	12,4	12,2	10,8	87,1
Estonia	11,1	12,2	10,6	95,5
Finland	11,0	10,8	10,4	94,5
Netherlands	10,7	10,8	10,3	96,3
Germany	10,8	10,5	9,6	88,9
Greece	9,5	10,2	9,3	97,9
Poland	8,3	8,3	8,1	97,6
Great Britain	9,3	9,2	7,7	82,8
Italy	8,1	8,4	6,9	85,2
Spain	7,6	8,5	6,5	85,5
France	6,8	6,7	5,8	96,7
Sweden	6,1	5,9	5,0	82,0

Source: Europe in figures. Eurostat Yearbook 2012.

5. Using the EU budget for financing environment at protection

Poland has been financing 18 – 20 % of investment earmarked for the environmental protection from the EU subsidies. The program "Infrastructure and the environment" has been targeted on that objective. In practical terms, the countries that are the beneficiaries of the program pay

more attention to infrastructure investment than environmental projects (including Poland), yet it does not discredit high opinion about the program. The budget of the EU obtains revenue mainly from payments from the treasuries of the member states set at about 1% of GDP. "The Financial Perspective for 2007 – 2013", ie the budget of the EU amounted to 1035 billion euro, that is over one trillion euro. The budget for 2014 – 2020 has been cut due to the economic downturn experienced throughout the EU and the declared need for savings. A draft of the budget, to be presented to the European Parliament by the European Commission, quotes 908 billion euro (a budget must have positive balance, deficit will not be tolerated).

Despite a smaller budget, according to a new financial perspective Poland, as the main beneficiary, is to receive 105.8 billion euro, i.e. approximately 441 billion PLN. That sum allocated to Poland is by 4 billion euro bigger than what it received within 2007 – 2013. The funds received by Poland are to be broken down as follows: 72.9 billion euro allocated to cohesion fund, and 28.5 billion euro to common farming policy and the development of rural areas.

The terms of allocation of those funds stipulate that usually they do not cover all costs of a project, but in most cases co-finance 50 – 70% thereof. Hence enterprises of local government entities must provide their own share. Another important ecological stipulation of the new budget is the so-called green prerequisite for projects amounting to 20%. Hence, 1/5 of total outlays on economic projects must be related to the protection of the natural environment.

Bibliography

1. Best Practive in Analysing and Developing Environmental Policies. Institute for European Environmental Policy, London – Brussels 2005.
2. Communication from Commission to the Council and European Parliament – GDP and beyond: measuring progress in a changing world. COM 2009 (0433).
3. J. Delors: Economic Governance in the European Union: Past, Present and Future. "Journal of Common Market Studies", vol. 51, 2013, no. 2.
4. L. and D. Dziawgo (ed.), K. Gorka: Finance and Environment (e.g. Environmental funds in Poland). Dom Organizatora, Torun 2003.

5. Europe in figures. Eurostat Yearbook. European Commission, Luxembourg 2012.
6. Cz. Glinkowski (ed.), K. Gorka: The chosen problems of effectiveness of restructuring (due to the system transformation). AE, Poznan 2006.
7. K. Gorka: The earmarked funds as a basic economic instrument of environmental policy in Poland. "Aestimum" (Firenze University Press), 2006, no. 48, p. 1-17.
8. K. Gorka, P. Szyja: Regional policy of the European Union versus Sustainable Development. "Barometr Regionalny" (Zamosc) 2012, no. 3 (29), p. 7-12.
9. B. Poskrobko (ed.): Towards the Theory of Sustainable Development. PAN, Bialystok-Warsaw 2007.
10. State environmental policy in 2009-2012 and perspective until 2020 (and executive programme). Ministry of Environment, Warsaw 2008.
11. World and European Energy and Environment Transition Outlook. Publications Office of the EU, Luxembourg 2011.
12. J. Zielonka: The International System in Europe. "Journal of European Integration". 2013, no. 1.

【Lecture's Profile】

Dr. Kazimierz Górka

Professor Emeritus, Ph.D., works at the Cracow University of Economics, former head of the Department of Industrial and Environmental Policy.
Co-founder, first chairman and activist of a Polish Division of the European Association of Environmental and Resource Economists, active member of the Polish Economic Society, advisor to the Ministry of Environment and local authorities, co-editor of the journal "Ekonomia i Środowisko", collaborating with American, Japanese, Lithuanian and other universities.
Author and co-author of many articles, books, expert reports and other works on industrial economics, renewable energy, labour costs, economics of environmental protection and environmental policy, especially in the field of economic instruments for sector policies.

【Coordinators' Profile】

Dr. Takayuki Yamaguchi

Professor, School of Business Administration, Kwansei Gakuin University
Kwansei Gakuin University, Ph.D(Business Administration). Prior to accepting current position in 2009, he taught at Kwansei Gakuin University as a full-time lecturer and an associate professor. Specializes in SME policy in France and its theoretical study. His activities include Director of La Société Franco-Japonaise de Gestion, Secretary General of the Society for the History of Management Theories, Chairperson of external evaluation for Credit Guarantee Association (Hyogo).

Dr. Akira Ichikawa

Associate Professor, Institute for Industrial Research, Kwansei Gakuin University
Keio University, Ph.D. (Media and Governance). Prior to accepting current position in 2012, he taught at Keio University, Nagoya University of Commerce and Digital Hollywood University as a part-time lecturer. He also worked at Keio Institute at SFC as a visiting senior researcher and Tokyo Institute of Technology as a research fellow. His field of specialty is the regional study in the enlarged EU and global environmental governance.

EU Institute in Japan, Kansai

Consortium of 3 Universities

KOBE UNIVERSITY

OSAKA UNIVERSITY

Project funded by
the Eruopean Union

Organiser:
EU Institute in Japan, Kansai（*EUIJ-Kansai*）

Co-host:
Institute for Industrial Research, Kwansei Gakuin University