



ACHIEVEMENT OF THE RES TARGET FOR 2020 ANALYSIS OF THE CURRENT SITUATION AND A FORECAST

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WARSAW, 17 MAY 2016

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ACHIEVEMENT OF THE RES TARGET FOR 2020. Analysis of the current situation and a forecast.
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TABLE OF CONTENTS

SUMMARY	4
1. METHODS OF CALCULATION OF THE SHARE OF ENERGY FROM RES	6
2. USE OF ENERGY FROM RENEWABLE SOURCES IN HEATING AND COOLING.....	7
3. USE OF ENERGY FROM RENEWABLE SOURCES IN ELECTRICITY SECTOR	9
4. USE OF ENERGY FROM RENEWABLE SOURCES IN TRANSPORT	11
5. THE FORECAST ABOUT THE SHARE OF ENERGY FROM RES IN THE GROSS FINAL CONSUMPTION OF ENERGY.....	13
6. CONSEQUENCES OF NON-FULFILMENT OF THE OBLIGATIONS TOWARDS THE EU.....	15

SUMMARY

Poland has already performed more than a half of its obligations under Directive 2009/28/EC on the promotion of the use of energy from renewable sources. At the end of 2014, Poland achieved a 11.45% share of energy from renewable sources of the planned 15% in 2020 – 15.85%, to be exact, according to the National Action Plan (“NAP”) agreed with the EU. However, the achievement of the 15-percent target is not as certain as it might seem. The sector already questions the development of RES in three sectors settled by the European Union, i.e. heating and cooling, power and transport sectors.

The heating and cooling sector observed a significant decline in 2014. The sector, whose driving force are solid fuels, will have to deal with problems with acquiring biomass, which is additionally hampered by the amendment to the Renewable Energy Sources Act providing to an obligation to fire a certain percentage of local biomass as proposed by the governing party. At the same time, the sector statistics are also important because an inaccurate system may considerably affect the estimate of the share of green energy in generating heat in Poland.

After the years of record development of RES, the electricity sector will face a period of stagnation caused by the delayed implementation of a new support system resulting in an investment gap from the first auction to the commissioning of the first RES facilities operated in the new auction system. i.e. 1-4 years.

The worst situation is observed in the transport sector, which has observed a systematic decline in the share of energy from renewable sources for several years. 2016 and the following years will only deepen the downward trend since Poland has not developed the market for generation of 2nd generation biofuels, generating ineffective 1st generation fuels, and has not implemented the relevant provisions. In accordance with Directive 2009/28/EC, the achievement of the EU targets with 1st generation biofuels will be much more difficult from 2017.

It is estimated that Poland may become short of ca. 3.000 ktoe of the share of energy from RES in the total gross energy consumption, i.e. 30 percent below the target. Such green energy deficit may have two types of consequences. In the first instance, it might be necessary to carry out a statistic transfer, the cost of which may amount to ca. PLN 8 billion. In the second instance, a procedure regarding the infringement of EU obligations will be instituted against Poland. It will be aimed to mobilise Poland to implement the relevant mechanisms to achieve the assumed targets. In consequence, one-off and daily fines may be imposed on us. The latter ones are probable because the goal of the procedure is not to punish a country, but to mobilise it. Therefore, daily fines are to be expected until the assumed goal is achieved. The total value of the fines may even exceed the costs of the statistic transfer. The Directorate-General for Energy may initiate the pre-infringement procedure, a formal preliminary procedure against the Member States which have not achieved the assumed percentage thresholds of the share of energy from renewable sources in the final gross energy consumption, as soon as in 2017.

A further ignorance of a real problem moves Poland away from fulfilling the EU obligations until 2020. According to the data of the Ministry of Energy, Poland has not achieved the target pursuant to the NAP assumed for 2014. The “statistical” purchase of energy is only a temporary and an inefficient solution. Poland will not have any benefits from the money spent and will not solve the problem by 2030, when the Community is going to set new targets for the Member States. Poland has already made the same mistake with purchasing CO₂ emission allowances instead of implementing an efficient emission reduction system.

This is the last moment for Poland to implement the relevant mechanisms to fulfil the EU obligations. It is important that an efficient RES support system, enabling a further constructive development in the electricity sector, is implemented quickly. Even if the assumed targets are not achieved in all three sectors, it is important for Poland to show a good will and readiness to support RES, for instance by

making up for the losses in one sector by another sector. Such attitude will be certainly acknowledged by the European Union, which assesses the fulfilment of the EU targets and imposes fines. The activities taken now are significant not only in the perspective of 2020, but also in the perspective of 2030, and Poland is likely to be forced to take up specific obligations for 2030 due to its failure to achieve the assumed target.

1. METHODS OF CALCULATION OF THE SHARE OF ENERGY FROM RES

Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (“*Directive*”) sets out the common framework for the promotion of energy from renewable sources. At the same time, national overall targets for the share of energy from renewable sources in the gross final consumption of energy in 2020 were determined for each Member State. The mandatory national overall targets compose the assumed **20% share of energy from renewable sources in the gross final consumption of energy within the Community**.

The **target for Poland** is 15% in the gross final consumption of energy. This is the minimum target which Poland is obliged to achieve by 2020. According to the National Action Plan for energy from renewable sources made in 2010, which was agreed and accepted under Article 4 of the Directive by the European Commission, and then supplemented in 2011, Poland is committed to achieve a share of energy from renewable sources of 15.85% in the final consumption of energy in 2020. Further, each Member State should ensure that the share of energy from renewable sources in all forms of transport in 2020 is at least 10 % of the final consumption of energy in transport.

Article 5 of the Directive sets out the method of calculation of energy from renewable sources, the detailed **methodology and definition** used to calculate the share of energy from RES being set out in Regulation (EC) No 1099/2008 of the European Parliament and of the Council of 22 October 2008 on energy statistics (OJ L 304 of 14.11.2008, p. 1). Further, Member States are obliged to ensure coherence of statistical information used in calculating those sectoral and overall shares and statistical information reported to the Commission. On the grounds of the domestic law, the above issues are governed by the Regulation of the Minister of Economy of 4 April 2014 on the method of calculation of the gross final consumption of energy from renewable sources and the method of calculation of electricity and heat from such sources (Dz. U. [*Journal of Laws*] of 15 April 2014, item 487).

In accordance with Article 5 of the Directive, the gross final consumption of energy from renewable sources in each Member State shall be calculated as the sum of (i) gross final consumption of electricity from renewable energy sources, (ii) gross final consumption of energy from renewable sources in transport, and (iii) gross final consumption of energy from renewable sources for heating and cooling. At the same time, it must be borne in mind that in calculating gross final consumption of energy from renewable sources, solely non-fossil energy sources and biofuels and bioliquids that fulfil the sustainability criteria set out in Article 17 of the Directive are taken into account. Further, the amount of energy from renewable sources per one type of energy consumption is considered only once for calculating the gross final consumption of energy and is expressed in energy units.

As regards the method of calculation of the share of energy from RES in each sector, the gross final consumption of **electricity** from renewable energy sources or bioliquids is calculated as the quantity of energy, including electricity, heat or agricultural biogas converted to an equivalent quantity of electricity in a manner specified in the regulations issued on the basis of Article 9a Section 11 of the Energy Law, generated in RES, excluding the production of electricity in pumped storage units unless water has previously been pumped uphill using electricity produced in a renewable energy source. In calculating the gross final consumption of **electricity** from renewable energy sources, the actual annual electricity production by hydropower and wind power are taken into account in accordance with the normalisation rules set out in Annex II to the Directive.

The gross final consumption of energy from renewable sources **for heating and cooling** is calculated as the quantity of energy, including electricity or heat generated in RES, used for the purposes of district heating and cooling, plus the consumption of other energy from renewable sources in industry, transport

sector, households, services, including public services, agriculture, forestry and fisheries, including the consumption of electricity and heating by the electricity sector to generate electricity and heating and including losses of electricity and heating during their transmission or distribution. In addition, in calculating the gross final consumption of energy from renewable sources, electricity and heating generated by passive energy systems under which lower energy consumption is achieved passively through building design or from heat generated by energy from non-renewable sources, are not taken into account. At the same time, in calculating the gross final consumption of energy from renewable sources for heating and cooling, aerothermal, geothermal and hydrothermal heat energy captured by heat pumps, considered energy from renewable sources in the quantity calculated in accordance with the methodology laid down in Annex VII to the Directive, is taken into account. In calculating the gross final consumption of energy from renewable sources for heating and cooling, in the case of heat pumps, the guidelines for the Member States regarding the calculation of renewable energy from heat pumps for different heat pump technologies pursuant to Article 5 of Directive 2009/28/EC, which is annexed to Commission Decision of 1 March 2013 establishing the guidelines for Member States on calculating renewable energy from heat pumps from different heat pump technologies pursuant to Article 5 of Directive 2009/28/EC of the European Parliament and of the Council, apply.

Further, jointly for the electricity and heating sectors, where electricity and heating is produced in a multi-fuel plant, in calculating the gross final consumption of energy from renewable sources, the portion of electricity or heating produced in the plant, evidenced by measurement and settlement systems, equivalent to the percentage share of chemical energy of biomass, biogas or agricultural biogas in chemical energy calculated on the basis of the actual calorific values of the fuel consumed is accounted for.

Finally, as regards the third sector, in calculating the final consumption of energy from renewable sources for **transport**, energy carriers, including biocomponents, liquid biofuels, liquid fuels and other renewable fuels used for the purposes of transport, as well as electricity generated in RES used for the purposes of transport by all types of electric road vehicles, are taken into account. The calorific values of fuels are determined in Annex III to the Directive.

At the same time, in accordance with Article 22 of the Directive, each Member State must submit a **report** to the Commission on progress in the promotion and use of energy from renewable sources **every two years**. Poland has already submitted three such reports, i.e. report for the periods 2009-2010, 2011-2012 and 2013-2014. The information concerning the use of energy from RES in each sector presented in the reports is prepared on the basis of the data of the Central Statistical Office, which, in turn, relies on the results of statistical surveys of the public statistics using SHARES_2014 (Short Assessment of Renewable Energy Sources), which is made available by Eurostat. Therefore, the data concerning the use of energy from RES in each sector presented below are based on the data presented by Eurostat.

2. USE OF ENERGY FROM RENEWABLE SOURCES IN HEATING AND COOLING

The share of energy from RES in the gross final consumption of energy in heating and cooling was growing systematically until 2013 to achieve 14.07%. However, **2014 observed a decline** by 5.4% to 13.95%. Nevertheless, Poland still **achieved the share of 13.29%** for that year as assumed in the NAP.

The level of consumption of energy from RES in heating and cooling sector, included in the aforementioned subsector, is impacted by **solid biofuels**, since the share of biomass in the total consumption of energy from RES in the sector was systematically growing from 2009, observing the only decline in 2014. Nevertheless, this fuel type is responsible for ca. 98% of consumption of energy from renewable sources in heating and cooling. However, the majority of this sector are statistics. The

government adds each biomass combusted in Polish households, even wood for fireplace, to the RES target. There is no monitoring system, and the **calculations are based on a survey made every three years by the Central Statistical Office**. The most recent survey was carried out in January 2016. The results will be published at the end of the year. Depending on the answers of ca. 5 thousand respondents (out of nearly 13.6 million households in Poland), the production of “green” heat in Poland may change. The differences are significant because this renewable energy source makes up more than 50% of the total Polish target.

At the same time, according to the Eurostat data, the main contributor to the above share of the use of energy from RES in the heating and cooling sectors is the so-called final energy consumption subsector (*Final Energy Consumption/EN*). The group includes the consumption of energy in all industrial sectors, except for consumption of energy in the electricity sector, i.e. consumption of energy produced for the sector’s own purposes and energy acquired by producers and distributors for their own operational purposes, including consumption of fuels as part of side energy consumption not being the core business of an enterprise, as well as consumption of energy in other sectors outside the energy, industrial or transport sector, like e.g. private households, minor industry, craft, trade, administrative entities, and services, except for transport, agriculture and fisheries.

The other subsector as regards the level of consumption of energy from RES is the **heating subsector, in cogeneration with derived heat**, which includes, in particular, the total energy production in cogeneration. This group observed a systematic **growth until 2012** and achieved 455 ktoe. Later, the sector observed a **decline** with 340.9 ktoe **at the end of 2014**. With a share of 88.5%, professional electricity units are the main contributors to the production of heat from RES, the share of industrial electricity units being 11.5% in 2014. The production of heat from RES in professional electricity units focuses mainly on CHP plants, whose share in 2014 was 91%. The share of heat plants in 2014 was 9%. It should be borne in mind, however, that both groups of professional electricity units have observed a decline of the share of energy from RES in the consumption of energy from renewable sources. The situation in the industrial electricity sector is similar. In 2014, CHP plants were responsible for 83% of production of heat from RES and heat plants, for 17%. Like in the case of professional electricity units, the industry sector has observed a decline in the use of RES in heat production since 2013, which suits the aforementioned downward trend of the share of energy from renewable sources in the whole heating and cooling sector in Poland in connection with the reduction in co-incineration.

With 77,3 ktoe in 2014, **the share of biogas is small** in comparison with the share of biomass of 4,771.4 ktoe. At the same time, bioliquids are not used in heating and cooling in Poland.

Heat pumps, which are the third component of the use of energy from RES in heating and cooling sector, are the least developed and constitute only a **small fraction of the total consumption** equal to less than 1% in 2014.

RES – heating and cooling (ktoe)	2010	2011	2012	2013	2014
Final consumption of energy	4.375.6	4,582.1	4,590.5	4,871	4,582.1
Heat in cogeneration	254.5	321.2	455	381.9	340.9
Energy from heat pumps	4.9	5.7	6.4	7	13
Total use of RES in heating and cooling	4,635	4,909	5,051.9	5,259.9	4,936
Use of RES in heating and cooling – NAP ¹ (%)	12.29	12.54	12.78	13.05	13.29
Use of RES in heating and cooling – Eurostat (%)	11.72	13.12	13.36	14.07	13.95

Table 1: Share of energy from renewable sources in the gross final consumption of energy in heating and cooling (Source: NAP, Eurostat data)

3. USE OF ENERGY FROM RENEWABLE SOURCES IN ELECTRICITY SECTOR

The share of energy from RES in the gross final consumption of energy in the electricity sector has been growing systematically since 2004 to achieve 12.4% in 2014. With 10.68%, **the record growth** was observed **in 2012** in comparison to 8.16% in 2011, owing to a significant development of simple co-firing technology in coal power plants and wind power, which constitute the most dynamically developing technologies and made up nearly 84% of the share of energy from RES in the electricity sector in 2014. The percentage shares of the individual technologies **in 2014** for green electricity was as follows:

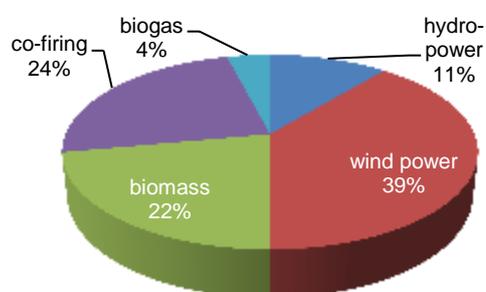


Figure 1. Share of RES in 2014 (Source: ARE S.A.)

The share of wind power has been growing systematically since 2010, with the highest growths observed in 2012 and 2013 and the total installed capacity at the end of 2014 of 3,836 MW. According to the data provided by the industry, **2015 was a record year**, where the highest growth of the installed capacity in wind power plants was observed with the total value of ca. 5500 MW at the end of April 2016 – providing to approx. 12 TWh electricity production per year.

The share of **biomass co-firing** in power plants and CHP plants as well as **dedicated facilities** in the consumption of energy from RES in the electricity sector was growing systematically until **2012** and achieved the **highest level of 819.3 ktoe** to abruptly decline in **2013** to 682 ktoe as a result of

¹ National target for the use of energy from renewable sources presented in the National Action Plan for energy from renewable sources made in 2010, corrected in a supplement to the National Action Plan for energy from renewable sources made in 2011.

suspension of production of energy in co-incineration caused by oversupply of green certificates. In 2014, the biomass sector **again observed a significant growth** of the share of consumption of energy from RES.

Water energy observed a growth in the period 2004-2014 from 177.4 ktoe to 204 ktoe. However, **no significant changes** have been observed since 2010.

Photovoltaics have hardly any share in the use of RES in the electricity sector. A minimum growth was observed in 2012 (0.1 ktoe), with 0.6 ktoe at the end of 2014.

RES – electricity sector (ktoe)	2010	2011	2012	2013	2014
Hydropower	202	203.3	203	203	204
Wind power	146.2	251.2	387.8	527.3	651.2
Solar power	0	0	0.1	0.1	0.6
Biomass	507.8	614.6	819.3	682	787.6
Other RES	34.3	38.8	48.6	59.3	70.2
Total use of RES in electricity sector	890.3	1,108	1,458.8	1,471.7	1,713.6
Use of RES in electricity sector NAP² (%)	7.53	8.85	10.19	11.13	12.19
Use of RES in electricity sector – Eurostat (%)	6.65	8.16	10.68	10.73	12.40

Table 2: Share of energy from renewable sources in the gross final consumption of energy in electricity (Source: NAP, Eurostat data)

After the record 2015, which observed a very quick development of wind power providing in total to approx. 12 TWh this year, **the situation in this year will be worse**. Due to an insufficient support from 1 January 2016, coal power plants stopped simple biomass co-firing, only co-firing in so called dedicated installations still receive 1 green certificate per MWh, so a significant drop of 4.3 TWh co-firing in 2015 to approx. 1.5 TWh of co-firing in 2016 should be observed. In addition, due to the on-going summer drought, this year may be the next year in a row to observe a decline in production in hydro power plants – in 2015 the production dropped to 1.8 TWh compared to 2.2 TWh in 2014. Other technologies will rather not increase their production in 2016, i.e. dedicated biomass with 4.6 TWh, biogas installations with 0.9 TWh and other technologies including PV with 0.2 TWh – providing to 22.6 TWh green electricity in 2015. Due to the significant drop of co-firing which will not be fully replaced by onshore wind commissioned end of 2015 and beginning in 2016 the production of “green” current in 2016 will slightly drop to approx. 21.5 TWh. At the same time, **the consumption of energy** during the first four months was **significantly growing** by 2.18%. **The target has also grown** – this year, it will be 13.85%. It should be borne in mind that a quick development of the wind sector, resulting in a change of the current RES support system, should be considered an exception rather than a market trend. It should not be expected that such development rate will prevail since in the period 2016-2018 – as announced by the Ministry of Energy, the first “non-test” auctions will take place not before 2017 – there will be an **investment gap** from the first auction to the commissioning of the first RES facilities operated in the new support system. Only facilities which gain support at auctions will face investment decisions, the construction and start-up of facilities taking up to two years for wind power and biogas installations,

² National target for the use of energy from renewable sources presented in the National Action Plan for energy from renewable sources made in 2010, corrected in a supplement to the National Action Plan for energy from renewable sources made in 2011.

up to one year for photovoltaics, and even up to four years for large biomass facilities, waste incineration plants or new co-firing units. If everything goes according to plan, the projects winning the auction in 2017 will be commissioned as late as in 2018 in the case of photovoltaic facilities, biogas plants and wind power plants, and not before end of 2019 in the case of large biomass facilities. It should be borne in mind that due to the current progress of project development, it is estimated that large biomass facilities with the total capacity of approx. 100 MW will be able to join the auction at the beginning of 2017 – no incineration plants or co-firing units are at relevant development stage to qualify for 2017 auction, and other projects which are currently at the **average stage of obtaining complete design rights** will be able to join the auction as late as in 2018 or later. It is thus highly doubtful that the above facilities will contribute to a remarkable increase in the share of consumption of clean energy in electricity in 2020. It should be also borne in mind that, in accordance with the amendment to the RES Act, biomass facilities will be required to consider the minimum necessary share of the so-called **local biomass** in the total biomass starting from 2017, which requires an additional project feasibility analysis, and the share of local biomass and growing prices thereof form a significant risk in the 15-year support period.

It is also notable that, despite some forecasts contained in the NAP, the development of production of electricity by **offshore wind power** is envisaged to start as late as **2023/2024** due to the complexity of such type of projects and the time necessary to obtain complete project rights.

It may be thus expected that after the years of record development of RES sector, the electricity sector will face a period of stagnation in the investment market, which will result in problems with achieving the targets assumed in the NAP as soon as in 2016, and the next years will not bring any significant RES development from electricity, and the share of renewable sources in the total consumption of energy will remain at a similar level, with a minimum upward trend only. Only onshore wind farms with approx. 3 GW ready-to-build projects and ground-mounted 1 MW photovoltaic installations with approx. 1 GW ready-to-build projects could provide to a green electricity production in 2020 to fulfil at least RES-e target, but the Polish government shows no political will to support to those technologies in the auction.

4. USE OF ENERGY FROM RENEWABLE SOURCES IN TRANSPORT

The share of energy from RES in the gross final consumption of energy in transport was subject to considerable fluctuations in the period 2009-2014. The largest **growth was observed between 2009 and 2010** due to a large growth in the share of biofuels in transport, including mainly biodiesel, which led to the achievement of the share of energy from RES of 6.16% in comparison to 4,92% in 2009. However, **after the record year 2011, a continuous decline** of the share of energy from RES in the transport sector has been observed, mainly due to a reduction in the consumption of biofuels, since this ratio fell from the record share of 6.39% to 5.67% in 2014, which considerably deviated from the forecasts presented in the NAP of 2010 and its supplement of 2011, and the direction of changes is still negative. At the same time, the share of electricity from RES in transport in the period 2009-2014 was developed to a minimum extent only, and **it is not expected to grow during the next years**.

RES - transport (ktoe)	2010	2011	2012	2013	2014
Road transport	0.3	0.3	0.3	0.3	0.4
Rail transport	43.2	48.3	48.5	53.2	54.5
Other means of transport	5.1	5.5	5.2	5.3	5.8
Biofuels, (biodiesel, bioethanol, bio-ETBE)	867.4	915.5	807.3	747.5	705.4
Total use of RES in transport	916.6	970.1	861.9	806.9	766.7
Use of RES in transport - NAP ³ (%)	5.84	6.56	7.27	7.79	8.05
Use of RES in transport – Eurostat (%)	6.16	6.39	5.98	6.03	5.67

Table 3: Share of energy from renewable sources in the gross final consumption of energy in transport (Source: NAP, Eurostat data)

It is expected that the downward trend may last or even deepen since Poland has not developed the technology for production of bioethanol, the share of which has been systematically declining since 2010, and focused on the development of biodiesel production, i.e. 1st generation biofuels. However, in accordance with Article 17 of the Directive, with effect from 1 January 2017, the possibility to fulfil the national target by share of 1st generation biofuels from agricultural raw materials which do not reduce CO₂ emissions by more than 50% will be significantly limited.

Further, **Poland has not implemented the regulations allowing an increase in the national production of 2nd generation biofuels** (from waste), which prevents a further growth in this segment, since according to a new directive, the share of biofuels in transport in 2020 may not exceed 7 percentage points of 10% target. The adoption of a relevant law was postponed to the last quarter of 2016. At the same time, it should be borne in mind that potential quality tests of new biofuels would consume a lot of precious time.

The transition period applied by Poland is also unfavourable. In the transition period, the sale of petrol with an addition of up to 10% of ethanol also requires that fuel with an addition of up to 5% be made available to clients until 2020. At the same time, petrol stations and wholesale outlets do not have separate tanks for another fuel type. Further, logistics of distribution and sale of two petrol types (actually three types, including premium petrol) is too costly. In consequence, almost all sellers in Poland offer only petrol with the addition of up to 5% of ethanol.

Poland also lacks a sufficient supervision of the biofuels market, and **European producers have already filed a complaint to the European Commission**, since in their opinion, enormous quantities of biofuels, which were probably included in the “green” target at the wholesale level and then were not sold to clients, flow out of Poland. From the perspective of the achievement of the target, the sealing of the western and southern borders against inflow of fuels from grey zone, which is very important for the government and state budget, may be also a problem. If the sale thereof is included in the consumption balance, Poland will need much more biofuels to achieve its target for 2020.

Bearing the foregoing in mind, it is doubtful that Poland will manage to implement the relevant mechanisms to “make up” for the necessary share of energy from renewable sources with biofuels by 2020.

³ National target for the use of energy from renewable sources presented in the National Action Plan for energy from renewable sources made in 2010, corrected in a supplement to the National Action Plan for energy from renewable sources made in 2011.

5. THE FORECAST ABOUT THE SHARE OF ENERGY FROM RES IN THE GROSS FINAL CONSUMPTION OF ENERGY

According to the presented data, the share of energy from RES in the gross final consumption of energy was successively growing from 2010 to achieve 11.45% in 2014, i.e. less by 0.16% than the share of 11.61% assumed in the NAP, which was also confirmed by the Ministry of Energy in February 2016⁴. **The upward trend was caused by a successive decline of the total consumption of energy in Poland**, which resulted in a reduction of the denominator in the formula for calculation of the share of RES in the total consumption of energy in Poland. Such trend has prevailed since 2011 as after the record year 2010 in terms of the total consumption of energy in Poland, which amounted to 69,174 ktoe, it began to successively decline to achieve 64,239 ktoe in 2014. These developments **were caused, mainly, by global warming**, which can be also felt in Poland. Relatively high temperatures in winter contribute to the reduction in heat and energy production. It is, therefore, indeed true that the share of energy from RES in the gross final consumption of energy is growing, yet not due to the actual growth in the consumption thereof, but due to the reduction in the total consumption of energy in Poland. However, despite the reduced total consumption of energy in Poland, the targets assumed under the NAP for 2014 have not been achieved, which adds to the **concerns whether the share of 12.08% assumed for 2015 will be achieved**.

Energy consumption	2010	2011	2012	2013	2014
NAP ⁵ (%)	9.58	10.16	10.74	11.21	11.61
Eurostat (%)	9.24 ↑	10.28 ↑	10.88 ↑	11.34 ↑	11.45 ↓
Total consumption of energy – Eurostat (ktoe)	69,174	67,442.6	67,235.4	65,961.1	64,239

Table 4: Share of energy from renewable sources in the gross final consumption of energy (Source: NAP, Eurostat data)

At the same time, it must be remembered that Poland also has to fulfil the obligation regarding the mandatory share of energy from renewable sources in transport of 10% by 2020. However, this share has been systematically declining to reach 5.67% in 2014 in comparison to 8.05% assumed for the same period.

⁴ Ministry of Energy, *Zielona Energia z odpadów – wsparcie wytwarzania energii elektrycznej z OZE*, Warsaw 2016.

⁵ National target for the use of energy from renewable sources presented in the National Action Plan for energy from renewable sources made in 2010, corrected in a supplement to the National Action Plan for energy from renewable sources made in 2011.

Energy consumption	2015	2016	2017	2018	2019	2020
KPD ⁶ (%)	12.08	12.66	13.35	14.09	14.94	15.85
Total consumption of energy – NAP ⁷ (ktoe)	64,000	65,000	66,100	67,100	68,200	69,200
Total consumption of energy from RES – NAP ⁸ (ktoe)	7,731	8,232	8,826	9,453	10,186	10,967

Table 5: Forecats of the share of energy from renewable sources in the gross final consumption of energy (Source: NAP, Eurostat data)

Bearing in mind the circumstances described in each Chapter of this Report, **the share of energy from RES in the gross total consumption of energy is supposed not to grow to the mandatory level of 15%**, or specifically the level of 15.85% assumed by Poland, by 2010. On the basis of market and legal conditions, the share of RES in electricity and heating and cooling will not grow in the next years according to the forecasts; stagnation in the development of these areas is rather to be expected. As regards the transport sector, in the opinion of the authors of this Report, the downward trend of the share of energy from renewable sources is expected to prevail. The share will certainly not almost double, which would fulfil Poland's obligations towards the EU. Therefore, according to the forecasts of the authors of this Report, Poland is **expected to achieve the share of energy from RES of ca. 7.500 ktoe** out of the total share of energy from RES in the gross final consumption of energy assumed for 2020 of 10,967 ktoe .

⁶ National target for the use of energy from renewable sources presented in the National Action Plan for energy from renewable sources made in 2010, corrected in a supplement to the National Action Plan for energy from renewable sources made in 2011.

⁷ National target for the use of energy from renewable sources presented in the National Action Plan for energy from renewable sources made in 2010, corrected in a supplement to the National Action Plan for energy from renewable sources made in 2011.

⁸ National target for the use of energy from renewable sources presented in the National Action Plan for energy from renewable sources made in 2010, corrected in a supplement to the National Action Plan for energy from renewable sources made in 2011.

SHARE OF ENERGY FROM RES 2010 - 2014 (IS) AND 2015 - 2020 (NAP/TREND)

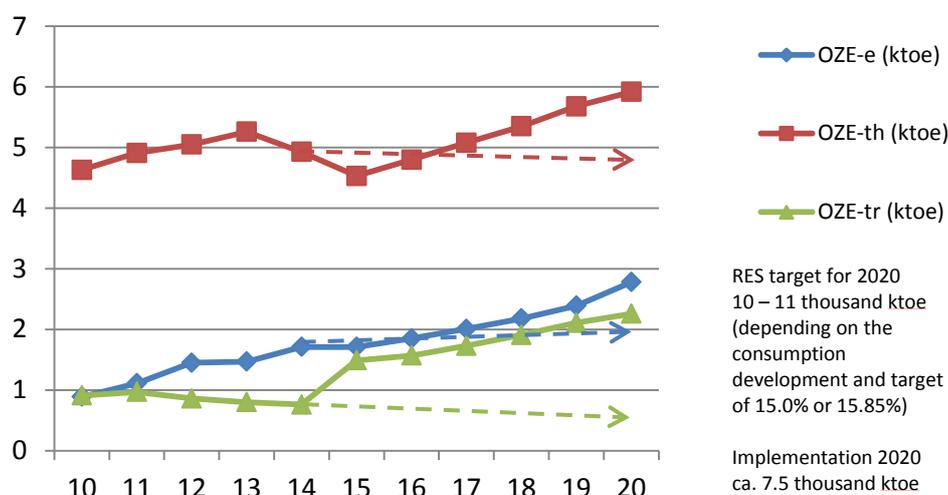


Figure 2: Share of RES in 2010-2014 (Source: NAP data, own study)

6. CONSEQUENCES OF NON-FULFILMENT OF THE OBLIGATIONS TOWARDS THE EU

If Poland fails to achieve the 15% target of the use of energy from renewable sources in the gross final consumption of energy, two scenarios will be possible, i.e. **a statistical transfer or imposition of a fine** in the course of an infringement procedure instituted against Poland.

The Directive does not provide for any specific mechanism aimed to force the Member States to fulfil the RES targets defined for 2020 or any detailed mechanism to impose sanctions if a Member State does not achieve the same. Therefore, it is assumed that **standard procedures** will apply if a Member State does not fulfil its obligations under the EU regulations as provided in the Treaty on the Functioning of the European Union (*infringement procedure/EN*). As a result of such procedure, a Member State infringing on its obligations towards the EU is subject to sanctions, including fines, depending on the circumstances of the infringement of the obligation, as well as its significance and scope. In the light of the foregoing, it is notable that the goal of such procedure is not to punish a Member State for the non-fulfilment of its obligations towards the EU, **but to mobilise it to take relevant steps aimed to achieve the target**. Therefore, the potential fines are imposed on a state until the obligations are fulfilled rather than for the sheer fact of infringing them. The relevant measure applied by the EU includes daily rates charged until the implementation of the relevant measures by a Member State.

At the same time, each state will be accounted for the obligations it defined in the national action plans, and the potential fines will be imposed with respect to the minimum national targets presented in the Directive. It must be also remembered that, in the case of a potential procedure, not only the fact of infringing specific obligation, but also the reasons of such development as well as the **actions taken to date by the state to achieve the target** will be taken into account. It will be also significant whether a Member State did not achieve the minimum target for the share of energy from RES due to the failure to take the relevant steps **in all three sectors**, or e.g. the failure to achieve the target resulted from a change of market or climatic conditions, beyond the control of the state, the state having taken initiatives to compensate the shortage of energy from RES in one sector with a surplus in another sector so as to achieve the minimum target.

Therefore, in 2017, the Directorate-General for Energy is going to initiate the pre-infringement procedure, a formal preliminary procedure against the Member States which have not achieved the assumed percentage thresholds of the share of energy from renewable sources in the gross final consumption of energy. Each Member State against which such procedure is instituted may present its standpoint and propose an investment plan to achieve the national targets assumed for 2020. However, if in the course of the pre-infringement procedure, the Directorate-General will consider the strategies assumed to be insufficient to guarantee the achievement of the required share of energy from RES, it is assumed that the ultimate **infringement procedures** governed under the TFEU will be instituted in 2018. Unfortunately, the perspective of instituting formal procedures by the Directorate-General for Energy is real since the first procedure is to be instituted as soon as this year against the Netherlands, which do not implement the strategy assumed in their NAP and do not achieve the thresholds of the minimum share of energy from renewable sources in the total consumption of energy for a given year.

A method to avoid the aforementioned procedures may be a statistical transfer from another Member State having a surplus of "green energy". Poland may benefit from the fact that many states should exceed their targets, and the EU as a whole is likely to have a surplus of eco-energy, which may be traded in. This should keep the transfer prices within some limits. However, the total price – depending on the final gap in 2020 – may account for billions of zlotys. The current prices of green certificates on the basis of **certificates of origin** in the European countries with a surplus of green energy fluctuate between **30 EUR/MWh in Rumania to 45 EUR/MWh in Sweden**. However, it should be borne in mind that these prices, negotiated bilaterally between the EU Member States **around 2020 are likely to grow** due to the upcoming deadline for the settlement of the achievement of the national targets and the threat of fines for the infringement thereof. Assuming that Poland may **fall short of ca. 3000 ktoe of energy (ca. 35 TWh)** and, with a conservative approach, **a price of ca. 50 EUR/MWh**, it would be necessary to carry out a statistical transfer of electricity from RES for an amount of ca. EUR 1.8 billion, i.e. ca. PLN 8 billion⁹ to achieve the EU target of 15%. From the perspective of the state policy, a statistical transfer is a loss of money, compared to the fee for CO2 emissions.

⁹ It should be also borne in mind that, in the opinion of some branch experts, the prices may even reach much more than 100 EUR/MWh, since the states having a considerable surplus of energy will offer them within statistical transfers at the so-called marginal costs, i.e. the energy from RES produced in 2020 at the highest cost (up to 150 EUR/MWh) (ca. G. Wiśniewski, *Realizacja unijnych zobowiązań w zakresie udziału energii z OZE*, „Czysta Energia” 2/2016, Poznań).