

Pursuant to paragraph 1 from Article 146 of the Energy Law (“Official Gazette of Republic of Macedonia” No. 16/11, 136/11, 79/13, 164/13, 41/14, 151/14, 33/15 , 192/15, 215/15, 6/16, 53/16 and 189/16), the Government of the Republic of Macedonia on the session held on 21 April 2017 adopted

**ACTION PLAN AMENDING THE ACTION PLAN FOR RENEWABLE ENERGY SOURCES OF THE REPUBLIC OF MACEDONIA TO 2025 WITH VISION TO 2030**

**I**

The Action Plan for Renewable Energy of the Republic of Macedonia until 2025 with a vision to 2030 (“Official Gazette of Republic of Macedonia" No.207/15), in the title the words "with a vision to 2030" are deleted.

**II**

In the introduction point 1 section 1.4, in paragraph 10 the words "Scenario 2020-2025-2030" are replaced by "Scenario 2020-2025"

Paragraph 11 and the Table are amended as follows:

"The share of RES in gross final consumption of energy which could be achieved based on this scenario is 23.9% and it is estimated that in 2025 would be 25%."

**RES SHARE 2020-2025 (ktoe)**

	<b>2020</b>
<b>Electricity from RES</b>	<b>180</b>
HPPs	158
LHPPs	117
SHPPs	41
WPPs	12
PV Systems	3
Biomass	2
Biogas	5
<b>Heat from RES</b>	<b>268</b>
Biomass	252
Solar energy	5
Geothermal energy	11
<b>Bio fuels</b>	<b>54</b>
<b>TOTAL RES</b>	<b>502</b>
<b>GFEC</b>	<b>2,101</b>
<b>RES share (%)</b>	<b>23.9%</b>

<b>estimated</b>	<b>2025</b>
<b>Electricity from RES</b>	<b>247</b>
HPPs	203
LHPPs	149
SHPPs	54
WPPs	29
PV Systems	4
Biomass	3
Biogas	7
<b>Heat from RES</b>	<b>260</b>
Biomass	242
Solar energy	5
Geothermal energy	14
<b>Bio fuels</b>	<b>62</b>
<b>TOTAL RES</b>	<b>569</b>
<b>GFEC</b>	<b>2,275</b>
<b>RES share (%)</b>	<b>25.0%</b>

Table 1: Expected Gross Final Energy Consumption of the Republic Of Macedonia in Heating and Cooling, Electricity and Transport up to 2020 taking into account the Effects Of Energy Efficiency and Energy Saving Measures 2014-2030 (ktoe), Table 2: National overall target for the share of energy from renewable sources in gross final consumption of energy in 2005 and 2020 (figures to be transcribed from Annex I, Part A to Directive 2009/28/EC), Table 3: 2020 Indicative objective and estimated trajectory of energy from renewable sources in heating and cooling, electricity and transport, Table 4b: Table for calculation of the share of the renewable energy in transportation sector (ktoe), Table 10.a: Estimation of the available potential in Republic of Macedonia for each renewable energy technology in electricity, Table 11: Estimation of total contribution (final energy consumption) expected from each renewable energy technology in the Republic of Macedonia to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in heating and cooling, and Table 12 Estimation of total contribution expected from each renewable energy technology in the Republic of Macedonia to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the transportation sector 2013-2023, are replaced by the following tables:

**Table 1: Expected Gross Final Energy Consumption of the Republic Of Macedonia in Heating and Cooling, Electricity and Transportation to 2020 taking into account the Effects Of Energy Efficiency and Energy Saving Measures 2014-2025 (ktoe)**

	2009	2014		2015		2016		2017	
	base year	reference scenario	additional energy efficiency	reference scenario	additional energy efficiency	reference scenario	additional energy efficiency	reference scenario	additional energy efficiency
1. heating and cooling <sup>(1)</sup>	707	-	686	-	688	-	824	-	846
2. electricity <sup>(2)</sup>	695	-	704	-	690	-	712	-	698
3. transport as in Art. 3(4)a <sup>(3)</sup>	431	-	537	-	616	-	477	-	493
4. Gross final energy consumption <sup>(4)</sup>	1,832	-	1,928	-	1,994	-	2,013	-	2,037
<i>The following calculation is needed only if final energy consumption for aviation is expected to be higher than 6,18%</i>									
Final consumption in aviation	-	-	-	-	-	-	-	-	-
Reduction for aviation limit <sup>(5)</sup> Art. 5(6)	-	-	-	-	-	-	-	-	-
TOTAL consumption after reduction for aviation limit	-	-	-	-	-	-	-	-	-

	2018		2019		2020		2025	additional energy efficiency
	reference scenario	additional energy efficiency	reference scenario	additional energy efficiency	reference scenario	additional energy efficiency	reference scenario	
1. heating and cooling <sup>(1)</sup>	-	873	-	875	-	889	-	937
2. electricity <sup>(2)</sup>	-	684	-	672	-	671	-	713
3. transport as in Art. 3(4)a <sup>(3)</sup>	-	509	-	527	-	541	-	625
4. Gross final energy consumption <sup>(4)</sup>	-	2,066	-	2,074	-	2,101	-	2,275
	<i>The following calculation is needed only if final energy consumption for aviation is expected to be higher than 6,18% (4,12% for Malta and Cyprus):</i>							
Final consumption in aviation	-	-	-	-	-	-	-	-
Reduction for aviation limit <sup>(5)</sup> Art. 5(6)	-	-	-	-	-	-	-	-
TOTAL consumption after reduction for aviation limit	-	-	-	-	-	-	-	-

**Table 2: National overall target for the share of energy from renewable sources in gross final consumption of energy in 2009 and 2020 (figures to be transcribed from Annex I, Part A to Directive 2009/28/EC),**

A. Share of energy from renewable sources in gross final consumption of energy in 2009 (S <sub>2009</sub> ) (%)	17.7%
<b>B. Target of energy from renewable sources in gross final consumption of energy in 2020 (S<sub>2020</sub>) (%)</b>	23.9%
C. Expected total adjusted energy consumption in 2020 (from Table 1, last cell) (ktoe)	2,101
D. Expected amount of energy from renewable sources corresponding to the 2020 target (calculated as B x C) (ktoe)	502

**Table 3: 2020 Indicative objective for 2020 and estimated trajectory of energy from renewable sources in heating and cooling, electricity and transport**

	2009	2014	2015	2016	2017	2018	2019	2020
RES-H&C <sup>(1)</sup> (%)	29.0%	35.2%	35.8%	30.6%	30.2%	29.7%	30.1%	30.1%
RES-E <sup>(2)</sup> (%)	16.8%	19.7%	21.9%	21.9%	23.3%	24.8%	26.3%	26.8%
RES-T <sup>(3)</sup> (%)	0.4%	0.1%	0.1%	1.2%	3.5%	6.4%	8.3%	10.0%
<b>Overall RES share <sup>(4)</sup> (%)</b>	17.7%	19.7%	20.0%	20.6%	21.4%	22.3%	23.3%	23.9%
<i>Of which from cooperation mechanism <sup>(5)</sup></i>	-	-	-	-	-	-	-	-
<i>Surplus for cooperation mechanism <sup>(5)</sup></i>	-	-	-	-	-	-	-	-

Table 4b: Calculation table for the contribution of the renewable energy in transportation sector (ktoe),

	<b>2009</b>	2014	2015	2016	2017	2018	2019	2020	2025
(C) Expected RES final consumption in transportation <sup>(1)</sup>	1.9	0.3	0.3	5.9	17.0	32.4	43.7	53.9	62.3
(H) Expected RES electricity in road transportation <sup>(2)</sup>	-	-	-	-	-	-	-	-	-
(I) Expected consumption of biofuels from wastes, residues, non- food cellulosic and lingo-cellulosic material in transportation <sup>(2)</sup>	-	-	-	-	-	-	-	-	-
(J) Expected RES contribution to transportation for the RES-T share : $(C)+(2,5-1)\times(H)+(2-1)\times(I)$	1.9	0.3	0.3	5.9	17.0	32.4	43.7	53.9	62.3

**Table 10.a: Estimation of the available potential in Republic of Macedonia for each renewable energy technology in electricity, 2009-2025(for the period 2009 the presented data refer to actual installed power for generation of electricity in HPPs)**

	2009		2014		2015		2016		2017	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh	MW	GWh
<i>Hydro:</i>	<b>553.3</b>	<b>1358.6</b>	<b>632</b>	<b>1524.2</b>	<b>657.3</b>	<b>1594.8</b>	<b>659.5</b>	<b>1648.2</b>	<b>669.6</b>	<b>1702.1</b>
<i>&lt;1MW</i>	3.8		16.2		<b>95.6</b>		<b>97.8</b>	<b>293.2</b>	<b>107.9</b>	<b>347.1</b>
<i>1MW–10 MW</i>	34.8		53.7							
<i>&gt;10MW</i>	514.7		561.70		<b>561.7</b>		<b>561.7</b>	<b>1355.0</b>	<b>561.7</b>	<b>1355.0</b>
<i>Of which pumping</i>	-	-	-	-	-	-	-	-	-	-
<i>Geothermal</i>	-	-	-	-	-	-	-	-	-	-
<i>Solar:</i>	-	-	<b>14.8</b>	<b>14.4</b>	<b>16.7</b>	<b>22.6</b>	<b>17.4</b>	<b>24.3</b>	<b>20.8</b>	<b>29.1</b>
<i>photovoltaic</i>	-	-	14.8	14.4	16.7	22.6	17.4	24.3	20.8	29.1
<i>concentrated solar power</i>	-	-	-	-	-	-	-	-	-	-
<i>Tide, wave, ocean</i>	-	-	-	-	-	-	-	-	-	-
<i>Wind:</i>	-	-	<b>36.8</b>	<b>70.6</b>	<b>36.8</b>	<b>120.8</b>	<b>36.8</b>	<b>109.4</b>	<b>36.8</b>	<b>110.0</b>
<i>onshore</i>	-	-	36.8	70.6	36.8	120.8	36.8	109.4	36.8	110.0
<i>offshore</i>	-	-	-	-	-	-	-	-	-	-
<i>Biomass:</i>	-	-	-	-	<b>4.0</b>	<b>20.2</b>	<b>6.0</b>	<b>42.1</b>	<b>7.0</b>	<b>49.1</b>
<i>solid</i>	-	-								
<i>biogas</i>	-	-			4.0	20.2	6	42	7.0	49.1
<i>Bio liquids</i>	-	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>553</b>	<b>1,359</b>	<b>683</b>	<b>1,609</b>	<b>715</b>	<b>1,758</b>	<b>720</b>	<b>1,824</b>	<b>734</b>	<b>1,890</b>
<i>of which in CHP</i>	-	-	-	-	-	-	-	-	-	-



	2018		2019		2020		2025	
	MW	GWh	MW	GWh	MW	GWh	MW	GWh
<i>Hydro:</i>	<b>683.2</b>	<b>1748.2</b>	<b>696.9</b>	<b>1794.1</b>	<b>709.0</b>	<b>1835.1</b>	<b>866.0</b>	<b>2355.6</b>
<1MW	<b>121.5</b>	<b>393.2</b>	<b>135.2</b>	<b>439.2</b>	<b>147.3</b>	<b>480.2</b>	<b>191.1</b>	<b>628.0</b>
1MW–10 MW								
>10MW	<b>561.7</b>	<b>1355.0</b>	<b>561.7</b>	<b>1355.0</b>	<b>561.7</b>	<b>1355.0</b>	<b>674.9</b>	<b>1727.6</b>
<i>Of which pumping</i>	-	-	-	-	-	-	-	-
<i>Geothermal</i>	-	-	-	-	-	-	-	-
<i>Solar:</i>	<b>22.2</b>	<b>31.1</b>	<b>23.6</b>	<b>33.1</b>	<b>25.4</b>	<b>35.6</b>	<b>35.6</b>	<b>49.9</b>
<i>photovoltaic</i>	22.2	31.1	23.6	33.1	25.4	35.6	35.6	49.9
<i>concentrated solar power</i>	-	-	-	-	-	-	-	-
<i>Tide, wave, ocean</i>	-	-	-	-	-	-	-	-
<i>Wind:</i>	<b>50.0</b>	<b>140.0</b>	<b>50.0</b>	<b>140.0</b>	<b>50.0</b>	<b>140.0</b>	<b>150.0</b>	<b>337.9</b>
<i>onshore</i>	50.0	140.0	50.0	140.0	50.0	140.0	150.0	337.9
<i>offshore</i>	-	-	-	-	-	-	-	-
<i>Biomass:</i>	<b>8.3</b>	<b>54.3</b>	<b>10.0</b>	<b>61.2</b>	<b>14.2</b>	<b>81.1</b>	<b>22.0</b>	<b>124.0</b>
<i>solid</i>	1.3	5.2	3.0	12.1	6.2	25.0	10.0	40.0
<i>biogas</i>	7.0	49.1	7.0	49.1	8.0	56.1	12.0	84.1
<i>Bio liquids</i>	-	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>764</b>	<b>1,974</b>	<b>781</b>	<b>2,028</b>	<b>799</b>	<b>2,092</b>	<b>1,074</b>	<b>2,867</b>
<i>of which in CHP</i>	-	-	-	-	-	-	-	-

**Table 11: Estimation of total contribution (final energy consumption) expected from each renewable energy technology in the Republic of Macedonia to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in heating and cooling 2014-2025**

	2009	2014	2015	2016	2017	2018	2019	2020	2025
									(ktoe)
Geothermal (excluding low temperature geothermal heat in heat pump applications)	9	6	7	9	10	10	11	11	14
Solar	-			4	4	4	4	5	5
Biomass:	196	236	239	240	242	245	249	252	242
<i>Solid</i>	196	236	239	240	242	245	249	252	242
<i>Biogas</i>	-								
<i>Bio liquids<sup>(1)</sup></i>	-	-	-	-	-	-	-	-	-
Renewable energy from heat pumps:									
— of which aero thermal	-	-	-	-	-	-	-	-	-
— of which geothermal									
— of which hydrothermal									
Total	205	242	246	252	255	259	263	268	260
<i>Of which DH<sup>(2)</sup></i>	-	-	-	-	-	-	-	-	-
Of which biomass in households <sup>(3)</sup>	183	224	228	216	219	223	227	232	240

**Table 12 Estimation of total contribution expected from each renewable energy technology in the Republic of Macedonia to meet the binding 2020 targets and the indicative interim trajectory for the shares of energy from renewable resources in the transportation sector 2014-2025 ,**

	2009	2014	2015	2016	2017	2018	2019	2020	2025
Bio-ethanol/bio-ETBE	-	-	-	-	7.4	8.4	9.2	11.6	10.9
<i>Of which Bio fuels <sup>(1)</sup> Article 21(2)</i>	-	-	-	-	-	-	-	-	-
<i>Of which imported <sup>(2)</sup></i>	-	-	-	-	-	-	-	-	-
Biodiesel	1.9	0.3	0.3	5.9	9.6	24.1	34.5	42.3	51.4
<i>Of which Bio fuels <sup>(1)</sup> Article 21(2)</i>	-	-	-	-	-	-	-	-	-
<i>Of which imported <sup>(2)</sup></i>	-	-	-	-	-	-	-	-	-
Hydrogen from renewables	-	-	-	-	-	-	-	-	-
Renewable electricity	-	-	-	-	-	-	-	-	-
<i>Of which road transport</i>	-	-	-	-	-	-	-	-	-
<i>Of which non-road transport</i>	-	-	-	-	-	-	-	-	-
Others (as biogas, vegetable oils, etc.) — please specify	-	-	-	-	-	-	-	-	-
<i>Of which Bio fuels <sup>(1)</sup> Article 21(2)</i>	-	-	-	-	-	-	-	-	-
<b>TOTAL</b>	<b>1.9</b>	<b>0.3</b>	<b>0.3</b>	<b>5.9</b>	<b>17.0</b>	<b>32.4</b>	<b>43.7</b>	<b>53.9</b>	<b>62.3</b>

This Action Plan for amendment of the Action Plan for renewable sources of energy in the Republic of Macedonia to 2025 with vision to 2030 is published in the “Official Gazette of Republic of Macedonia”.

No. 44-1445/1

21 April 2017

Skopje

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